M I N U T E S

of the

NATIONAL COORDINATING COMMITTEE

National Cooperative Program on the Introduction,
Screening, and Preservation of Plant Material
(New Crops Program)

October 15-16, 1973
National Arboretum
Washington, D. C.

Covering the Following Projects Authorized

under the

Research and Marketing Act of 1946

NC-7	North Central Region Cooperating State Experiment Stations
NE-9	Northeastern Region Cooperating State Experiment Stations
S-9	Southern Region Cooperating State Experiment Stations
W-6	Western Region Cooperating State Experiment Stations
IR-1	Inter-regional Cooperative Potato Introduction Station
IR-2	Inter-regional Research Project IR-2

and

in cooperation with

The Agricultural Research Service
The Soil Conservation Service
The Forest Service

Chairman: C. R. Jackson, Associate Director, Georgia Agricultural Experiment Stations, Experiment, Ga.

Secretary: W. R. Langford, Coordinator, Regional Project S-9, Experiment, Ga.

CONTENTS

NATIONAL COORDINATING COMMITTEE FOR NEW CROPS
NATIONAL ARBORETUM
WASHINGTON, D. C., OCTOBER 15-16, 1973

AGENDA

October 15, 1973, 9:00 a.m.

I. Introductory Remarks.....Jackson

A. Welcome.....Creech
B. Interim Actions.....Jackson
C. Agenda Changes.....Jackson

II. International Germplasm Conservation Activities

A. Role of AID and Consultative Group on International Agricultural Research.....Baird
B. ARS/PASA Activities.....Hyland
C. TAC Report and UNEP Activities.....Creech

III. Reports from Interregional Projects

A. Potato Germplasm (IR-1).....Hougas, Ross
B. Virus-free Deciduous Fruit Stocks (IR-2).....Fridlund

IV. Report from ARS

A. Crop Germplasm Coordinating System.....Lewis & Jones
B. Germplasm Resources Laboratory.....White
C. National Seed Storage Laboratory.....Bass
D. Plant Germplasm Curators.....White, et al.

V. Reports from the Regional Stations

A. North Central (NC-7).....Skrdla, Hueg
B. Northeastern (NE-9).....Dolan, Barton
C. Southern (S-9).....Langford, Jackson
D. Western (W-6).....Dietz, Wilson

VI. Report from Northern Regional Research Center.....Tallent

VII. Report from Soil Conservation Service.....MacGlauchlan

VIII. Plant Explorations - Recommendations & Priorities.....Entire Group

IX. Informal Retrieval, Computerization of P.I. Records.....Sooy

X. Other Topics

A. Quarantine Restrictions on Corn, Millet, Sorghum.....White
B. Plant Pathogens.....Jackson
C. Status of Soybean Germplasm.....Hyland, White
D. Clonal Repositories for Fruits.....Peterson
E. Introduction of Protected Varieties.....Hyland
F. Plant Germplasm Newsletter.....White

XI. Committee Reports

II. Plans for Next Meeting

Representatives Present

North Central Regional Project NC-7

K. J. Lessman, Chairman elect, Regional Tech. Comm., Lafayette, Indiana
W. E. Hueg, St. Paul, Minnesota
J. H. Williams, Lincoln, Nebraska
R. M. Peterson, Brookings, South Dakota
W. H. Skrdla, Regional Coordinator, Ames, Iowa

Northeastern Regional Project NE-9

E. D. Carpenter, Storrs, Connecticut
F. C. Stark, College Park, Maryland
D. D. Dolan, Regional Coordinator NE-9

Southern Regional Project S-9

C. R. Jackson, Adm. Advisor, Experiment, Georgia
E. L. Whiteley, Chairman, Regional Tech. Comm., College Station, Texas
R. G. Creech, Secretary, Regional Tech. Comm., Mississippi State, Miss.
W. R. Langford, Regional Coordinator, Experiment, Georgia

Western Regional Project W-6

M. L. Wilson, Adm. Advisor, Las Cruces, New Mexico
A. Perry Plummer, Chairman, Regional Tech. Comm., Ephraim, Utah
S. M. Dietz, Regional Coordinator, Pullman, Washington

Inter-regional Potato Introduction Station Project IR-1

Roman Ross, Sturgeon Bay, Wisconsin
R. W. Hougas, Madison, Wisconsin

National Seed Storage Laboratory, ARS

L. N. Bass, Head, NSSL, Fort Collins, Colorado

National Program Staff, ARS

Quentin Jones, Beltsville, Maryland
Charles F. Lewis, Beltsville, Maryland
R. J. Miravalle, New Orleans, Louisiana

Germplasm Resources Laboratory, ARS

H. L. Hyland, Beltsville, Maryland
A. J. Oakes, Beltsville, Maryland
R. A. Kilpatrick, Beltsville, Maryland
J. C. Craddock, Beltsville, Maryland
H. F. Winters, Beltsville, Maryland
G. A. White, Beltsville, Maryland

National Arboretum

J. L. Creech, Washington, D. C.

Northern Regional Research Laboratory

W. H. Tallent, Peoria, Illinois

Cooperative State Research Service

C. I. Harris, Washington, D. C.

Guests

Richard Sooy, Beltsville, Maryland

I. INTRODUCTORY REMARKS

The meeting convened at 9:00 a.m. in a conference room at the National Arboretum, Washington, D. C. Chairman C. R. Jackson called the meeting to order and asked each attendee to stand, introduce himself, and identify the station or agency that he represented. Dr. Jackson appointed a resolutions committee of E. L. Whiteley, H. L. Hyland, and W. H. Skrdla (Chairman).

Dr. John L. Creech, Director of the National Arboretum, welcomed the group; and offered the use of facilities, aid in travel arrangements, and secretarial help, if needed. Dr. Creech gave a brief history of the Arboretum and its research activities. More than 500,000 people visit the Arboretum annually. Plans are being made for 2 million visitors during the bi-centennial year 1976.

Dr. Jackson reviewed his actions on resolutions passed by this committee at its last biennial meeting. With regard to the resolution asking for better financial support and appointment of an advisory committee for the National Seed Storage Laboratory, a letter was written to Dr. Ned D. Bayley, Director of Science and Education, USDA pointing out the needs of NSSL. A letter was written to Dr. Rex Thomas, Deputy Administrator of Plant Science and Entomology Research, ARS, with copies of it going to Dr. R. G. Dahms and Dr. J. L. Creech requesting ARS employment of an entomologist at both the Southern and Northeastern Regional Plant Introduction Stations. Dr. Jackson reported no response to any of these and concluded that his requests were casualties of the reorganization of ARS. A letter was written to Dr. T. W. Edminister, Administrator of ARS asking ARS to explore the possibility of establishing a clonal repository for stone fruits at the Southeastern Fruit and Tree Nut Research Laboratory, Byron, Georgia. With regard to establishment of clonal repositories for maintaining germplasm of all other tree fruits and nuts, Dr. Jackson stated that he failed to contact the Americal Society for Horticultural Science for their reappraisal of needs and recommendations for establishing such repositories.

Dr. Dolan reported his efforts toward getting an entomologist for Project NE-9 whereby 60% of the entomologist's time would be used in screening plants for resistance to insects and 40% would be spent in studying mechanisms of insect resistance.

Dr. Jackson commented on the possibility of bringing into this group other agencies and international groups interested in the preservation of plant germplasm. Due to the austere budgets for travel, 1973 appeared to be the wrong time to do this. However Dr. Guy B. Baird of US/AID was invited to participate in this meeting.

The agenda prepared in advance of this meeting was discussed and the following topics were added:

1. Plant explorations - recommendations and priority of each.

2. Clonal repositories for fruits.

II. INTERNATIONAL GERMPLASM CONSERVATION ACTIVITIES

A. Role of AID and Consultative Group on International Agricultural Research

Dr. Jackson introduced Dr. Guy B. Baird, Associate Director (Research), Agency for International Development, U.S. Dept. of State, Washington, D. C. Dr. Baird gave the following report on the role of AID in International germplasm conservation:

AID has a longstanding interest in the collection, maintenance, evaluation and utilization of plant genetic resources as related to the agricultural needs of the less developed countries. This is reflected in an agreement with USDA initiated in 1955 under which technical advisory services and experimental quantities of seed and vegetative stock have been made available to many developing countries.

AID, acting as the representative of the U.S., has encouraged support by the Consultative Group on International Agricultural Research (CG)[1] for genetic resources on important food crops. At this time the CG is supporting six international agricultural research centers each of which deals with one or more basic food crops of the developing countries. These centers and the crops are:

1. IRRI (International Rice Research Institute - Philippines) - rice

2. CIMMYT (International Center for Corn and Wheat Improvement - Mexico) - corn, wheat, barley, triticale, cold-tolerant sorghum

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[1] The CG consists of about 29 members (countries, foundations, international organizations and representatives of developing countries) of which some 19 are donor members. The primary function of the CG is to identify high priority needs for international agricultural research in the context of developing countries, and to seek financial resources required to meet the needs.

3. CIAT (International Center for Tropical Agriculture - Colombia) - corn, dry beans, rice, cassava, tropical forages

4. IITA (International Institute for Tropical Agriculture - Nigeria) - corn, rice, cowpeas, yams, sweet potatoes, cassava

5. CIP (International Potato Center - Peru) - potatoes (S sp)

6. ICRISAT (International Crop Research Institute for the Semi-Arid Tropics - India) - sorghum, millets, chickpeas, pigeon peas

The U.S. input (through AID) amounts to about 25% of the operating and capital budgets of these centers. The remaining 75% is met by other donor members of the CG. Each Center is involved in assemblying a broad base of germ plasm for the crops concerned. This activity is considered as an integral part of the program covered by the operating budget.

At the instigation of the Technical Advisory Committee to the CG (TAC), a report was prepared by an expert committee which called for the establishment of a worldwide network of plant genetic resources centers. While approved by TAC, and in principle by CG, it was concluded that further consideration was required before actually agreeing to provision of funding. Considerations involved the scope of the recommended network, managerial arrangements, and the role of FAO.

In early October, 1973 a Sub-Committee of the CG on Plant Genetic Resources met in FAO Rome to develop revised proposals for consideration by the CG during its next meeting in early November, 1973. Basically the Sub-Committee recommends the establishment of an autonomous International Board on Plant Genetic Resources with its headquarters in FAO Rome and with the secretariat provided by FAO. This Board would be

supported by funds from the CG and would have the responsibility for determining priority needs in the establishment of the international network, for making specific recommendations for funding of such activities to the CG or other organizations, and in arranging for the implementation of these activities.

It is anticipated that this Board will take full cognizance of ongoing and planned efforts at the national, regional, international and private levels in further developing an international network on plant genetic resources. This would include consideration of appropriate relationship with UNEP as related to the latter's expected contribution in this field.

It seems likely that the CG will accept the recommendation of its Sub-Committee on Plant Genetic Resources, and that the International Board might be constituted within the next few months. As conceived, this could result in an increased support to international plant genetic resources by a number of donor members of the CG including the U.S.

A.I.D.'S PARTICIPATION IN THE INTERNATIONAL AGRICULTURAL RESEARCH CENTERS

The international agricultural research centers described below are funded by donor members of the Consultative Group on International Agriculture (CG). The U.S. (through A.I.D.) is the largest donor, providing about 25% of the core and capital budget requirements of the Centers. There are about 18 other donors made up of countries, international organizations and U.S. foundations. Developing countries are included in the CG membership through representatives from each of the five FAO regions.

Each Center is governed by an international Board of Trustees (or directors). The interdisciplinary scientific staffs are likewise international in character. Research is problem-oriented, and coupled with training and outreach programs designed to strengthen national capabilities in agricultural research and production.

1. International Rice Research Center (IRRI)

Location: Los Banos, The Philippines
(P.O. Box 583, Manila, The Philippines)

Research Orientation:

Multidisciplinary research intended to increase rice productivity, especially in Asia, and to improve its nutritive quality. High yielding rice varieties, together with a package of management practices to greatly increase yields in important rice growing regions, have been produced by combined efforts of plant breeders, pest control specialists, agronomists, soil scientists, irrigation and equipment engineers. Intensive research

is underway to develop varieties with built-in resistance to pests, unfavorable soil and water conditions, and with genetic traits for improved protein content and quality, to support rice production in more of the widely differing environments in which rice is grown, on a worldwide basis. Research into multiple-cropping systems and into problems of rain-fed lowland and upland rice is supplemental to continuing research on rice grown under controlled irrigation.

Budget Support (actual for 1973; estimated for 1974,1975)

(In Millions)

FY	Total Support, all sources	A.I.D. Support
1973	$2.9	$0.725
1974	4.4	1.100
1975	4.6	1.100

2. International Maize and Wheat Improvement Center (CIMMYT)

Location: El Batan, Mexico
Address: Londres 40, Mexico 6, D. F.

Research Orientation

Established 1969 to assist developing countries increase their production of corn and wheat. High-yielding, widely-adapted, semi-dwarf wheat varieties have been produced (building on earlier cooperative research between Mexico and the Rockefeller Foundation), and a package of cultural practices to exploit yielding capacity have been successfully introduced in many wheat deficient countries. Research is continuing on pest and drought-resistant variants of high-yielding varieties, with improved protein content, that will extend profitable wheat culture into many additional developing countries. A parallel program on breeding corn for higher yields, improved nutritive quality, resistance to insect pests and diseases, tolerance of unfavorable soils and climates continues to produce genetic types for plant breeders in many tropical environments. CIMMYT maintains the richest collection of corn germplasm resources in the world for use by corn breeders in the tropics and subtropics.

Budget Support (actual for 1973; estimated for 1974,1975)

(In Millions)

FY	Total Support, all sources	A.I.D. Support
1973	$6.1	$1.500
1974	5.5	1.375
1975	5.8	1.450

3. International Center for Tropical Agriculture (CIAT)

Location: Cali, Colombia, S.A.

Research Orientation

To identify and seek solutions to problems of agriculture in the lowland tropics, particularly in (a) the infertile, highly acid savanna lands of Colombia and Brazil, (b) the lowlands of coastal plains and alluvial river valleys, and (c) the low mountain valleys in Latin America. Research is concentrating on beef, swine, cassava, beans, rice, and maize and on farming systems. There is close cooperation with IRRI and CIMMYT. In connection with beef production, research includes attention to the promising forage legume, Stylosanthes guyanensis. Additionally, there is work on immunization techniques for protection of livestock against hemoprotozoal diseases that cause heavy losses in Latin America.

Budget Support (actual for 1973; estimated for 1974, 1975)

(In Millions)

FY	Total Support, all sources	A.I.D. support
1973	$4.3	$0.875
1974	5.4	.950
1975	6.6	1.650

4. International Institute for Tropical Agriculture (IITA)

Location: Ibadan, Nigeria, Africa

Research Orientation:

Established in 1968 to study of problems for improvement of food production in the humid tropics, and on the soil and crop management requirements for developing a stable, permanent agriculture. Attention is focused on (a) farming systems for food production in the lowland tropics, (b) cereal improvement, in cooperation with IRRI on rice, and with CIMMYT on maize, (c) food grain legume improvement, with major attention to cowpeas and lesser attention to pigeon peas, lima beans and soybeans, (d) root and tuber crop improvement with emphasis on yams, sweet potatoes and cassava and (d) farming systems involving a study of the"slash and burn" practice. Progress is being made in identifying strains of cereals and root crops with improved protein content, particularly the amino acid, lysine, that is generally deficient in such crops.

Budget Support (actual for 1973; estimated for 1974,1975)

(In Millions)

FY	Total Support, all sources	A.I.D. Support
1973	$5.5	$1.200
1974	6.4	1.500
1975	7.2	1.800

5. International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)

Location: Hyderabad, India

Research Orientation:

Established in 1972 (a) to serve as the world center for improvement of genetic potential for grain yield and nutritional quality of sorghum, pearl millet, pigeon peas and chickpeas; (b) to develop farming systems that will be more productive in the seasonally dry semi-arid tropics, and (c) to assist national and regional research programs in other tropical and subtropical regions.

Attention will be concentrated on farming systems that emphasize efficient soil management and utilization of rainfall for crop production.

The research staff is to be multidisciplinary, and international in character, fully assembled by 1974.

Budget Support (actual for 1973; proposed for 1974, 1975)

(In millions)

FY	Total Support, all sources	A.I.D. Support
1973	$3.0	$0.745
1974	5.6	1.000
1975	9.6	2.400

6. International Potato Center (CIP)

Location: La Molina, Peru, S.A.

Research Orientation.

Established in 1972 to enhance world's capacity to meet goals of increased output and greater efficiency in production of potatoes, for both highland and lowland tropical areas. The major projects include (a) development of a potato germplasm for the full range of genetic variability for tuber-bearing Solanum species, (b) the development of diseases, viruses and insect pests, (c) the development of cold resistance, and (d) increasing the protein content of potato tubers. Completion of facilities construction and assembly of the international staff of research scientists is planned by end of calendar year 1974.

Budget Support (actual 1973; proposed 1974, 1975)

(In millions)

FY	Total Support, all sources	A.I.D. Support
1973	$1.4	$0.340
1974	2.3	.550
1975	2.2	.560

7. International Laboratory for Research on Animal Diseases (ILRAD)

Location: Kabete (near Nairobi), Kenya, Africa

Research Orientation:

This Center will deal initially with two important livestock diseases that occur in tropical and subtropical areas: trypanosomiasis and East Coast Fever. It will undertake studies that require sophisticated facilities and specific research specialists that are generally beyond the capacity of individual countries. These diseases are regional in their occurrence and cause severe losses of livestock if allowed to multiply unchecked.

ILRAD was scheduled for starting in FY '73, but construction of facilities and assembly of the research staff will continue in calendar years 1974 and 1975.

A.I.D. proposed a "starter" contribution of $100,000 for 1973, to be increased in subsequent years.

8. International Livestock Research Center (ILCA)

Location: Ethiopia, south of Addis Ababa

Research Orientation:

The initial effort will begin with the collection of information on tropical and subtropical livestock production, both published and unpublished, and the retrieval, storage, and classification of such information to serve research and development programs. Attention will be directed toward characterization of the common livestock production systems as a basis for designing suitable research projects. Research activities will be concentrated on techniques of rangeland management, livestock production, disease control, dry season animal nutrition, forage supplies, including supplemental forages, livestock reproductive performance, and all technological aspects of marketing. Priority will be given to cattle, sheep, goats, buffaloes and camels, in that order. The institute will deal with production on dry ranges, in humid regions, and in mixed crop-livestock systems.

This institute is expected to be initiated in late 1973 with a "start-up" budget to which AID plans to contribute.

U.S. (AID) Contributions to International Centers (Approximate)

(Core plus capital budgets)

	1968	1969	1970	1971	1972	1973	1974 (est.)
IRRI			.350	.750	.750	.725	1.100
CIMMYT		.425	.525	.769	1.090	1.500	1.350
IITA			.450	1.145	1.005	1.200	1.500
CIAT			.200	.680	.721	.875	.950
CIP					.100	.340	.550
ICRISAT					.100	.745	1.000
ILRAD							.550
ILCA							
		.425	1.525	2.344	3.746	5.385	7.000

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B. ARS/PASA Activities

Howard Hyland reported that through Participating Agency Service Agreements 48 AID Missions in developing countries have been supplied or assisted in the procurement of plant germplasm by the New Crops Research Branch of ARS. Many of these missions are concerned with tropical agriculture.

Mr. Hyland commented on the maintenance of coffee germplasm and a few other tropical crops. Seedlings of new coffee introductions are grown at Glenn Dale and plants are transplanted to Miami or Mayaguez for maintenance. Introductions of cocoa have been handled the same way. The Dioscorea spp. (Mexican yam) are maintained at Mayaguez.

C. TAC Report and UNEP Activities

Dr. John Creech reviewed the work of the Technical Advisory Committee to the Consultative Group on International Agricultural Research. The Consultative Group was organized in 1971 upon initiative of the World Bank. The main purpose of the Consultative Group is to mobilize long-term financial support from international agencies, governments and private sources for financing international agricultural research institutions. The Consultative Group has, at present, 29 members. They include the World Bank as Chairman, FAO and UNEP as co-sponsors as well as 12 governments - Belgium, Canada, Denmark, France, Germany, Japan, Netherlands, Norway, Sweden, Switzerland, United Kingdon, United States -,three regional Development Banks - African, Asian and Inter-American Development Bank -, the Commission of the European Communities, three private Foundations - Ford, Rockefeller and Kellogg Foundation -, and the International Development Research Centre, an independent Canadian organization.

The first meeting of the Consultative Group was held in Washington on May 19, 1971. It appointed 12 experts to constitute a Technical Advisory Committee (TAC) to assist its work. TAC's responsibilities are to:

(i) advise the Consultative Group on the main gaps and priorities in agricultural research related to the problems of the developing countries, both in the technical and socio-economic fields, based on a continuing review of existing national, regional and international research activities;

(ii) recommend to the Consultative Group feasibility studies designed to explore in depth how best to organize and conduct agricultural research on priority problems, particularly those calling for international or regional effort;

(iii) examine the results of these or other feasibility studies and present its views and recommendations for action for the guidance of the Consultative Group;

(iv) advise the Consultative Group on the effectiveness of specific existing international research programs; and

(v) in other ways encourage the creation of an international network of research institutions and the effective interchange of information among them.

An Ad Hoc work group for the Technical Advisory Committee met at Beltsville March 1972 to prepare a project for the "Collection and Conservation of Plant Genetic Resources and the Establishment of a Global Network of Genetic Resources Centers". Following is a summary of the work group's recommendations:

"In order to conserve genetic resources against the needs of the future without retarding agricultural expansion it is recommended that a global network of genetic resources centres be established as rapidly as possible, involving both developed and developing countries. The main focus of this would be on ten regional genetic resources centres; plus a smaller number of crop-specific centres - including the existing and proposed "International Centres" being supported by members of the Consultative Group. All of the centres recommended in fact form part of organizations already in existence, thus maximising experience and minimizing capital costs. The regional centres would in turn form the nucleii of a network of cooperating national stations in developing countries, support for which is also proposed according to agreed priorities as an integral part of the programme.

To guide the operations of this network and to facilitate collaboration with centres in developed countries it is proposed that a Coordinating Committee be established. This would control a central fund for exploration, collection, training, and information, which would be allocated in response to requests from regional and other cooperating centres according to need. The Committee would be composed of not more than ten leading scientists in the field of genetic resources, to be selected by the TAC. It would be supported by a small central staff of three specialists and it is recommended that this be located in FAO Headquarters under a Trust Fund providing appropriate safeguards for its independence. It would complement and cooperate with the existing FAO Crop Ecology and Genetic Resources Unit, and its size has been determined accordingly.

A strong training effort is proposed mainly to strengthen national capacity to participate in the network (shortage of trained personnel at regional centres is not expected to be a major constraint). Approximately 40 graduate students would be trained to M. Sc. level at specialized institutions, in addition to shorter training courses at regional centres, etc.

The proposed programme would cost approximately $5.4 million spread over five years, with the bulk of the limited capital expenditure in the first two years. The report identifies priority crops and regions for emergency action in the first year, but it is anticipated that the full network of regional and crop-specific centres could be operative by the third year.

Genetic resources, if preserved, will never be exhausted like minerals, and can always be utilized in plant improvement. It is essential that the genetic variation which still exists can be drawn upon and that the natural evolution of species can continue; on this not only immediate progress in agriculture but man's future food supplies depend. The proposal presented here offers a very cheap means of ensuring this, and one with which it is hoped that the TAC and the Consultative Group members will be able to identify and associate themselves".

Further details on proposed locations of Genetic Resource Centers, crop prioeities of each, and funding of each Center are recorded in the Report of TAC Ad Hoc Working Group held in Beltsville, USA. 20-25 March, 1972 and entitled: The Collection, Evaluation and Conservation of Plant Genetic Resources.

III. REPORTS FROM INTERREGIONAL PROJECTS

A. Potato Germplasm (IR-1) - R. W. Ross

Introduction

Three hundred sixty-three introductions from 10 countries were received in 1971 and 1972. Most were provided by organized expeditions collecting through Peru, Bolivia and Argentina. Additionally, some 300 long-stored seed packets containing remnants of original species collections were received from J. G. Hawkes in 1972. Contingent upon duplication and viability, the latter may eventually provide as many as 100 species collections not introduced earlier.

Preservation

True seed introductions constitute 66% and clonal introductions 34% of the tuber-bearing Solanum stocks received within the past 15 years. Maintenance as true seed is more reliable and economical than maintenance as clonal lines. As a precaution against the loss of clonal germplasm, self and interclonal pollinations are attempted with all tuber introductions. Approximately 90% of the introductions now contained in the collection are maintained as true seed.

The 1970-72 seed increases previously packeted in quantities of 200 for transmittal to the National Seed Storage are presently being repackaged in quantities of at least 500 in response to the suggested change in procedure. This proceeds in conjunction with 1973 seed increase packeting, and involves some 500 introductions. Over 600 seed lots were tested for germinability, and nearly 800 clones were indexed for viruses A, M, S, X and Y, during 1971 and 1972. Additional greenhouse space comprising two abutting compartments totaling 968 sq. ft. was acquired in 1971 at no cost, through a federal property transfer. With expansion, greenhouse accomodations now total 6,484 square feet.

Distribution

Shipments totaling 3,462 seed and 2,833 tuber samples of species introductions, and 147 seed and 2,616 tuber samples of germplasm involving introductions developed by the cooperative USDA-Wisconsin genetics program, were made during 1971 and 1972. These were sent to potato workers in 22 states in this country and in 33 other countries.

Nearly 400 copies of the current "Inventory of Interspecific and Intervarietal Hybrids of Tuber-Bearing Solanum Species" have been distributed to active and potential potato researchers around the world. Published in 1972, this issue supersedes Bulletin 533-Supplement, 1966. Yearly mimeographed listings of species introductions available in the form of tuber families have been distributed since 1967, and 121 requests have been received to date in response.

Classification

J. G. Hawkes, Solanum taxonomist, spent one month here in 1971 annotating herbarium specimens and classifying the species introductions added to the IR-1 collection since 1968. Taking advantage of the diverse group of interspecific hybrids assembled here, he began a study of the taxonomic relationships among the wild diploid species of the Central Andes.

J. P. Hjerting, a member of several Solanum collecting expeditions, spent two months here in 1972 plotting the recorded collection sites of non-cultivated species introductions contained in the IR-1 collection as well as other recorded herbarium specimen collections. This information will be used to plan future collecting expeditions.

Evaluation of Stocks

Evaluation of the Solanum introductions for desirable economic characters and breeding behavior is essential for their effective use in potato breeding. Through the cooperative effort of state, federal and foreign laboratories, stocks in the IR-1 collection are being steadily evaluated.

General use of species introductions distributed:

	1950-1970	1971-1972
Pathological Studies, Screening	10,841	990
General Breeding Programs	7,186	994
Entomological Studies, Screening	4,635	521
Genetic and Cytogenetic Studies	3,467	822
Horticultural Studies, Evaluations	3,233	1,166
Physiological and Biochemical Studies	1,506	272
Nematode Studies, Screening	1,350	267
Taxonomic and Biosystematic Studies	1,025	397
Stock Germplasm Centers	414	839
Teaching Aid, Exhibit	139	7
Home Garden, Ornamental	119	14
	33,915	6,289

The somatic chromosome number of 207 species introductions were obtained in 1971.

Usefulness of Potato Introductions

The usefulness of potato introductions is difficult to determine precisely. Two criteria may be employed, however, to gain some insight in this respect: 1) the scientific articles reporting use of the Solanum introductions and 2) the number and commercial production of modern varieties which carry foreign introductions in their pedigree.

Numerous technical papers and graduate theses appear each year reporting research with introduced Solanum species. Sixty-two such papers were published in 1971 and 1972.

One-hundred twenty-five of the 129 American potato varieties developed and released during the past 40 years through the combined efforts of private, state and federal breeders have two or more foreign introductions in their pedigree. These varieties usually compose about 65% of the total seed potato production in the United States. Two new potato varieties, Abnaki and Hudson, each with six introductions in its pedigree, were released in the United States in 1971 and 1972 respectively.

International Cooperation

The IR-1 project has made a constant effort to maintain close relations with Solanum germplasm centers throughout the world. Recently, Solanum germplasm centers have developed in Colombia, Peru and Argentina, their organization based upon and aided by the IR-1 project. As these centers become established, IR-1 will have ready access to a broader sample of Solanum germplasm.

Relevant Publications by IR-1 Personnel

De Jong, H. and P. R. Rowe. 1971. Inbreeding in cultivated diploid potatoes. Potato Res. 14:74-83.

De Jong, H. and P. R. Rowe. 1972. Genetic markers in inbred clones of cultivated diploid potatoes. Potato Res. 15:200-208.

Lee, Heiyoung K., R. Kessel and P. R. Rowe. 1972. Multiple aneuploids from interspecific crosses in Solanum: Fertility and cytology. Canad. J. Genet. Cytol. 14:533-543.

Ross, R. W. and P. R. Rowe. 1972. Inventory of interspecific and intervarietal hybrids of tuber-bearing Solanum species. Wisconsin Agr. Exp. Sta. Pub. R1695, 40 p.

Rowe, P. R., L. Sequeira and L. C. Gonzalez. 1972. Additional genes for resistance to Pseudomonas solanacearum in Solanum phureja. Phytopathology 62:1093-1094.

Rowe, P. R. 1972. The IR-1 potato collection, p. 63-67 in French (ed.): Prospects for the potato in the developing world. CIP, Lima, Peru.

Rowe, P. R. and L. Sequeira. 1972. Development of potato clones with resistance to bacterial wilt, p. 206-211 in French (ed.): Prospects for the potato in the developing world. CIP, Lima, Peru.

Discussion

Dr. Hougas expressed his appreciation to the S-9 and W-6 Regional Technical Committees for their support of IR-1, and he asked for similar support from this committee. In view of the difficulty ARS has in filling the vacant position in IR-1 because of personnel ceilings, Dr. Jackson asked about the possibility of ARS contracting with the 53 state stations to operate IR-1 and perhaps even the regional stations. Dr. Jones indicated this is not a good procedure to circumvent personnel ceilings.

Dr. Jackson asked the resolutions committee to prepare a resolution asking ARS to place another scientist at Sturgeon Bay to coordinate Project IR-1.

B. Virus-free Deciduous Fruit Stocks (IR-2)

This project was not represented at this meeting. No report was submitted.

IV. REPORT FROM ARS

A. Crop Germplasm Coordinating System - Lewis and Jones

Dr. Quentin Jones explained the recent organization of an ARS Germplasm Coordinating Committee and outlined its function and responsibilities as an integral part of the National Plant Introduction Program.

Questions were raised by Dr. Wilson, Dr. Hueg, and Dr. Jackson as to why we should have two overlapping committees. Dr. Jones explained that the new ARS Committee would function as an in-house group to periodically review ARS activities in plant introduction and germplasm conservation and make recommendations for meeting ARS responsibilities in the national program.

Following is the report prepared by Dr. Jones and Dr. C. F. Lewis giving a brief history of plant introduction in this country, development of the regional programs, organization and function of the ARS Germplasm Committee, and activities and responsibilities of other participants in the national plant germplasm program.

INTRODUCTION AND MAINTENANCE OF PLANT GERMPLASM

Preamble

Broadly defined, germplasm is any living material. Obviously, everything cannot be saved so historically that part of the total judged worthy of keeping for current and future uses has been assembled and maintained. This is done by Federal and State agencies, private companies, and individuals in the United States, and many foreign nations have excellent collections of germplasm. The Agricultural Research Service has had a leading role for this function in the United States.

A. History

The Federal Program

The introduction, distribution, and maintenance of plant germplasm was recognized as a national responsibility in 1827 when President Thomas Jefferson instructed U.S. Foreign Service officers abroad to "collect and transmit seeds and plants, with information regarding climate, soil propagation, cultivation, insect pests, and uses, and agricultural literature." Twelve years later, in 1839, Congress passed its first appropriation for agriculture--a sum of $1,000--to be used primarily in collecting and distributing seed. This undertaking was then under the direction of the Patent Office and marked the beginning of an ever-increasing group of activities which ultimately led to the organization of the Department of Agriculture in 1862. As the Department grew and the demands for the sustained introduction of useful plants increased, a separate unit was created in 1898 to centralize such activities for the Federal Government. For the next 50 years this remained largely a Federal program.

Development of Regional Programs

The Research and Marketing Act (RMA) of 1946 authorized the appropriation of funds to the Department of Agriculture and to the State Agricultural Experiment Stations for cooperative research of concern to two or more States. Joint Federal-State committees conceptualized the RMA objective. One of the first cooperative programs developed involved "research to encourage the discovery, introduction, and breeding of new and useful agricultural crops, plants, and animals, both foreign and native.....," and was identified as the Federal-State Cooperative Program for New Plants. It became operational in 1947.

1. Objectives

The regional programs seek to contribute to the stability of the agriculture of our nation, to enhance its development, and to provide it with new vistas by fulfilling the expressed and continuing needs of research workers for plant germplasm drawn from world resources. Stated another way, the Regional Projects furnish scientists with germplasm needed in their research.

The four Regional Projects have very similar titles: viz., "The Introduction, Multiplication, Preservation and Evaluation of New Plants for Industrial and Agricultural Utilization." The stated objectives and methodology of the projects are:

a. To cooperate and participate in a coordinated program of foreign and domestic plant exploration and the introduction of germplasm potentially valuable for agricultural and industrial uses in each region by:

   (1) Determining the germplasm needs of scientists in each region.

   (2) Recommending that the New Crops Research Branch, CR, ARS, USDA, conduct foreign and domestic explorations for, or otherwise obtain, needed material.

   (3) Receiving within the region, all introductions of plant genera for which each Regional Project is assigned primary responsibility, and other plants of interest.

b. To multiply, evaluate, and maintain introduced materials assigned to Regional Plant Introduction Stations and to provide accessions to the National Seed Storage Laboratory for long-term conservation.

c. To distribute introduced plant materials within the region and cooperatively to other regions, to publish results, to maintain records of their use and potential value, and to publish, update, and distribute catalogs of seed available for distribution.

Such research provides information on chemical, physical, genetic agronomic, horticultural, disease and insect resistance, and conservation, and beautification characteristics of introductions that are potentially valuable for improving existing crops or developing new crops in the United States.

2. Organization

For convenience in coordinating the national cooperative program, geographic lines were drawn into four regions--Northeastern, North Central, Western, and Southern--each with a State-Federal cooperative project. The designation for each Regional Project and the year each Regional Station was established is as follows:

Region	Designation	Location	Year Established
North Central	NC-7	Ames, Iowa	1947
Southern	S-9	Experiment, Ga.	1949
Western	W-6	Pullman, Wash.	1947*
Northeastern	NE-9	Geneva, N.Y.	1948*

*The W-6 project was initiated in 1947 and NE-9 in 1948. The Regional Stations were established in 1952 and 1953, respectively.

Puerto Rico is affiliated with the Southern Region, Hawaii with the Western Region, and Alaska with the North Central Region.

In each region there is a Regional Plant Introduction Station. A Coordinator supervises its activities and, with the aid of a Regional Technical Committee, coordinates evaluation of plant introductions within the region.

Each Regional Technical Committee, composed of an administrative adviser, a representative from each State AES, one from each participating Federal agency, and the Regional Coordinator guides the program. The administrative adviser is a Dean or Director of a State AES. He provides liaison between the Regional Project and the Experiment Station Directors.

Regional Technical Committees meet annually to hear and discuss accomplishments of cooperating agencies, to formulate plans for the coming year, and to recommend a budget for station operations. There may be regional crop group subcommittees to help advise the Technical Committee on specific matters. Each member of the Technical Committee serves as liaison between plant scientists in his State Experiment Station and the Regional Station. Minutes of Technical Committee Meetings, reports on new plant performance and annual reports are circulated among cooperators in all four regions.

Each Regional Station operates under a cooperative agreement between the State Experiment Station at which it is located and the ARS. The Experiment Station provides the land, seed storage and processing building, office space, and utilities. Financial support for operating the Stations is derived from Regional Research Funds, ARS funds, and in some cases, State appropriations made available by the State Experiment Station.

By agreement between the former New Crops Research Branch Investigations Leaders and the Coordinators of the four regional new crops projects, a system of priorities for receipt, increase, and maintenance of new plant germplasm is in operation. As an example, the Western Region has primary responsibility for maintaining bean introductions; the Southern Region for sorghums, the Northeastern Region for peas; and the North Central Region for corn.

Regional Introduction Stations are operated by multi-disciplined research teams, including the Coordinators (agronomist, horticulturist or plant pathologist), agronomist, entomologist, horticulturist, and plant pathologist. The professional staff members are, for the most part, employed by the ARS. In addition, there are farm, laboratory, and seed technicians, clerical and farm workers. Most of these are employed with Regional Research Funds or the ARS.

3. The Research Effort

All cooperating organizations participate in or sponsor evaluative research with new plant germplasm in accordance with their respective missions or objectives. The Regional Stations are the primary source of plant materials for such research, which may involve individual accessions or entire collections of plant materials.

The technical representative of each cooperating organization serves as local coordinator for the new plant germplasm program. He keeps the plant scientists in his organization or State informed of the availability of new introductions, and advises research workers of their responsibilities when they accept new plant germplasm.

It is the responsibility of the individual technical committee member to prepare annual reports of the progress on use of introductions within his State or organization for the Technical Committee and the Regional Coordinator. The individual technical committeeman may or may not engage personally in evaluative research, but he is most effective if he is in a position to speak for a wide range of germplasm needs.

Evaluative research with new plant germplasm may be undertaken at Regional Plant Introduction Stations. The Regional Plant Introduction Stations may make arrangements for evaluative research at other locations where crop requirements dictate.

4. Cooperation Among Agencies

Discussion to this point has concerned primarily the cooperation between State Experiment Stations and the former New Crops Research Branch, ARS. Until recently only the New Crops Research Branch had assigned staff scientists to the regional stations. The former Entomology Research Division, ARS, later placed entomologists at the North Central and Western Regional Stations and there are plans to eventually assign entomologists to the other stations. Each other cooperating Federal unit is represented on the Technical Committee of those regions in which they have active participation. This includes the Northern Regional Research Laboratory, ARS, the Cooperative State Research Service, the Forest Service, the Soil Conservation Service, and the Bureau of Land Management of the Department of Interior.

5. The Inter-regional Potato Program

Briefly stated, the objectives of the Inter-regional Project (IR-1) are to introduce, evaluate, and preserve the wild and cultivated tuber-bearing *Solanum* species; and to distribute these introductions to potato breeders and other scientists conducting research on the potato.

The operations of the IR-1 Project are along similar lines as the Regional "New Plants" Projects.

The general policies and direction of IR-1 are developed by a Technical Committee consisting of:

a. One representative actively engaged in potato improvement from each of the four regions (appointed by the Experiment Station Directors in each of the respective regions).

b. The leader of the Inter-regional Project (IR-1).

c. The leader of the Federal potato breeding project, former Plant Science Research Division, ARS.

d. A non-voting representative from the Cooperative State Research Service, USDA.

e. An inter-regional administrative advisory committee composed of an AES Director to represent each region, selected by the Regional Association of Directors. One of these is selected by the advisers to be the Inter-regional Administrative Adviser of IR-1.

The Inter-regional Technical Committee meets each year to formulate work plans, to prepare an annual budget request, and to make an annual report of progress. To insure effective utilization of new introductions the Technical Committee integrates the program of introduction, preservation, classification, distribution, and preliminary evaluation of the wild and cultivated species of *Solanum* with other State, Federal, Regional, or Inter-regional Projects or Subprojects relating to research on potato improvement. An executive committee consisting of the chairman, secretary, and project leader functions as an interim advisory group on matters that require attention between the regular meetings of the Technical Committee.

Most of the physical facilities of the IR-1 Project are located at the Peninsula Branch Experiment Farm, Sturgeon Bay, Wisconsin. Some office, laboratory, and greenhouse space is also provided by the University of Wisconsin at Madison.

6. The National Coordinating Committee

This Committee, consisting of representatives of the four regional programs, the inter-regional potato program, and each Federal agency, meets biennially. The chairman of the Committee is one of the Administrative Advisers. The purpose of the NCC is to provide a State-Federal forum for considering matters of mutual interest to all participants, and to speak as a unified voice in support of germplasm needs of agriculture.

Among the activities of this committee are: development of uniform procedures for regional activities, recommending actions to ARS for foreign and domestic explorations, undertaking feasibility studies, such as for the National Seed Storage Laboratory and on clonal repositories, and determining policies for the exchange of plant introductions between regions. The NCC hears reports from each participating project leader, arbitrates questions of inter-regional relations, and expresses points-of-view to ARS and CSRS.

B. Adjusting to Change

The regionalization of ARS in July 1972 has occasioned the need for readjusting our operational procedures to broaden and strengthen this vital national program. Research locations of the former crop Branches must now be more directly tied in with regional networks for acquiring and maintaining germplasm and the whole must be nationally coordinated to assure that U.S. agriculture's needs for germplasm will be met on a timely priority basis, that uniformity of documentation, identification, and scientific nomenclature be maintained, that wasteful duplication of effort be avoided, and that loss of valuable germplasm does not occur. The following discussion addresses itself to meeting those needs.

Definition of Terms

Germplasm. Germplasm placed in the maintenance system may be divided into two broad categories. One category is "introduced" materials. Plant materials from foreign countries are introduced into the United States. Such material must be processed through Plant Quarantine at the Plant Inspection Station where the P.I. number and other accession documentation are recorded. Plant Material is collected in the wild within the United States and such material also receives a P.I. number and accession records. The second category is "developed" material from the United States. Breeders use plant selection, hybridization, and other plant breeding methods to develop material with useful characters. This may range from mutants or selections with one desirable character to cultivars. At some point a decision is made to place certain developed materials into the germplasm maintenance system. Such material traditionally has not been assigned P.I. numbers. When germplasm enters the ARS germplasm maintenance system, it has a different status from the breeder's personal germplasm collection or his active breeding materials, subject to discarding at the breeder's discretion.

Crop Germplasm Curators. In the past research personnel of various crops has arranged for person(s) to assemble, catalog, maintain, and describe both "introduced" and "developed" germplasm. Their function has never been given an official designation; however, for clarity, they will be referred to as Crop Germplasm Curators.

Breeding Material Specialists. Traditionally a valuable service has been performed by scientists who coordinate the evaluation of elite breeding material in performance trials over a wide area. They may function as a planning coordinator only or they may actually assemble and distribute the plant material. This function has not been named previously; however, Breeding Material Specialist would distinguish

this function from that of the Crop Germplasm Curator. The Breeding Material Specialist and the Crop Germplasm Curator may or may not be the same person.

The Functional Network

ARS Plant Germplasm Coordinating Committee

Authority for planning and coordinating ARS input to a national program of introduction, documentation, distribution, evaluation, and maintenance of plant germplasm is vested in the National Program Staff and the ARS Plant Germplasm Coordinating Committee.

The ARS Plant Germplasm Coordinating Committee will be composed as follows:

National Representatives

Chairman

Quentin Jones, NPS, Plant Introduction

Vice-Chairman

C. F. Lewis, NPS, Genetics and Plant Breeding

Principal Plant Introduction Officer

H. L. Hyland
Germplasm Resources Laboratory
Plant Genetics and Germplasm Institute
USDA-ARS-Northeastern Region, ARC-West
Beltsville, Maryland 20705

Head, U.S. National Seed Storage Laboratory

L. N. Bass
U.S. National Seed Storage Laboratory
USDA-ARS-Western Region
Colorado State University Campus
Fort Collins, Colorado 80521

Regional Representatives

Northeastern Region

D. D. Dolan, Regional Coordinator
Regional Plant Introduction Station
USDA-ARS-Northeastern Region
Room 201 - Sturtevant Hall
State Agricultural Experiment Station
Geneva, New York 14456

G. A. White, Leader
Germplasm Resources Laboratory
Plant Genetics and Germplasm Institute
USDA-ARS-Northeastern Region, ARC-West
Beltsville, Maryland 20705

Southern Region

W. R. Langford, Regional Coordinator
USDA-ARS-Southern Region
State Agricultural Experiment Station
Experiment, Georgia 30212

Paul A. Fryxell, Research Geneticist
Southwestern Crop Genetics and Improvement Institute
USDA-ARS-Southern Region
Texas A&M University
College Station, Texas 77843

North Central Region

W. H. Skrdla, Regional Coordinator
USDA-ARS-North Central Region
Agricultural Experiment Station
Iowa State University
Ames, Iowa 50010

J. R. Wilcox
USDA-ARS-North Central Region
Agricultural Experiment Station
Purdue University
Lafayette, Indiana 47907

Western Region

S. M. Dietz, Regional Coordinator
USDA-ARS-Western Region
State Agricultural Experiment Station
Pullman, Washington 99163

F. H. McNeal
USDA-ARS-Western Region
Room 331, Johnson Hall
Montana State University
Bozeman, Montana 59715

Depending on problems or planning under consideration, the Chairman can request participation by one or more non-voting specialists.

Key Elements

ARS line units principally involved in the introduction, documentation, distribution, evaluation, and maintenance of plant germplasm are:

1. Germplasm Resources Laboratory, Plant Genetics and Germplasm Institute, Beltsville, Md.

2. Regional Plant Introduction Coordinators: Geneva, New York; Experiment Georgia; Ames, Iowa; Pullman, Washington.

3. Crop Germplasm Curators: identified for a crop or group of crops according to program needs.

   In this context, the Federal Plant Introduction Stations (Glenn Dale Maryland; Savannah, Georgia; Miami, Florida), the Federal Experiment Station, Mayaguez Puerto Rico; and the National Arboretum, Washington, D.C., have a role as curators of clonally propagated germplasm.

4. National Seed Storage Laboratory, Fort Collins, Colorado.

5. Breeding Materials Specialists: identified for a crop according to program needs.

Functions

1. ARS Plant Germplasm Coordinating Committee

   a. Complete an annual review of the total ARS program involved with the acquisition, documentation, distribution, evaluation, and maintenance of germplasm in light of national needs and goals.

      Based upon this review, recommend:

      (1) Programs of foreign and domestic plant exploration, exchange, and introduction

      (2) Increases and shifts in resources, both personnel and funds, to meet high priority needs

      (3) ARS position and response to recommendations of ARPAC/ARPF and international organizations concerning acquisition and maintenance of crop genetic resources

   b. Keep the Administrator, the Regional Deputies, and the National Program Staff informed of the problems, needs and progress of this national program.

2. Germplasm Resources Laboratory

   a. Provides a national focal point and clearing house for exchange of plant germplasm with foreign countries.

   b. Provides technical direction to the USDA Plant Inspection Station, Washington, D.C.

   c. Accessions, including assigning Plant Introduction (P.I.) numbers, all germplasm entering the national program from foreign countries and domestic collections from the wild and maintains the central documentation records in a form and in a system which will provide the framework for a national system for storage and retrieval of information on plant germplasm.

   d. In cooperation with the Plant Taxonomy Laboratory, provides for the identification and nomenclature of germplasm accessions entering the national program.

   e. Distributes incoming P.I. material, with copies of documentation records, to the Regional Coordinators or to designated Curators according to established regional crop priorities.

   f. Receives plant and seed material from the Regional Coordinators and other sources for filling foreign requests.

   g. Through its Principal Plant Introduction Officer, provides operational planning and logistical backstopping for approved plant explorations.

3. Regional Coordinators

   a. Provide the principal interface between ARS and SAES's and a regional focal point for ARS locations on matters pertaining to the acquisition, distribution, evaluation, and maintenance of P.I. and other germplasm.

   b. Through Regional Technical Committees, identify priority needs for germplasm and convey this information to the ARS Plant Germplasm Coordinating Committee with recommendations for meeting these needs.

c. Receive, increase, preliminarily evaluate, and distribute new P.I. accessions of germplasm to interested Federal, State, and private breeders within their region or to other Regional Coordinators.

d. As requested, provide seed and other propagation stock to the Principal Plant Introduction Officer to fill foreign requests.

e. Work cooperatively with Federal, State, and private users of germplasm in providing for the timely transfer of seed stocks of properly documented, valuable germplasm to the National Seed Storage Laboratory.

f. Be aware of germplasm collections being maintained within their regions and take steps to provide for the continued maintenance of collections endangered by personnel or program changes.

g. Provide for the orderly acquisition of evaluation data on germplasm accessions and the storage of these data in a form and system compatible with an overall national system for information storage and retrieval.

4. Crop Germplasm Curators

Crop Germplasm Curators can be conceptualized as extensions of the Regional Coordinators. Crop-specific requirements and the location of expensive facilities will no doubt dictate that some units continue in this role for the foreseeable future. On the other hand, shifts in programs or in research emphasis may require shifts in responsibility for maintenance of some germplasm collections.

a. In cooperation with the Regional Coordinator and specialists in his crop(s), assemble and/or maintain working collections of germplasm that for efficiency of operation or because of crop-specific requirements cannot be maintained by the Regional Plant Introduction Station(s).

b. Distributes, or arranges for Regional Coordinator(s) to distribute, germplasm to cooperators in accordance with research program needs.

c. Assures that potentially valuable germplasm no longer of apparent interest to the program he services, or upon termination of a program, is, through the Regional Coordinator, kept in the maintenance system.

5. Glenn Dale Plant Introduction Station

   a. Grows under prescribed quarantine conditions, introductions of those crop groups which are required by law to be grown under post-entry quarantine before being cleared for release to cooperators.

   b. When approved by APHIS, distribute cleared material through Regional Coordinators to Federal, State, and private cooperators.

6. National Seed Storage Laboratory

   a. Accepts documented accessions of germplasm in the form of seed in accordance with published policy.

   b. Provides for long-term storage of seed under optimal environments.

   c. Provides for periodic testing of germinability of seed lots and their rejuvenation as needed.

   d. Makes available to bona fide researchers seed of accessions not available elsewhere in the national germplasm maintenance system.

   e. Maintains records on all accessions being held by the Laboratory in a form and in a system compatible with an overall national system of information storage and retrieval.

7. Breeding Material Specialists

   People in this category will ordinarily have as their principal function the research evaluation of elite germplasm. A consequence of this activity will be the development of germplasm which is deemed worth saving.

   a. Arranges for the assembling and distribution of elite breeding material and coordinates its use in performance trials by several or more cooperators.

   b. Assures that valuable germplasm discovered or developed in the program, along with proper documentation and evaluation data, gets into the germplasm maintenance system through his Crop Germplasm Curator, or his Regional Coordinator, or directly to the National Seed Storage Laboratory.

B. Germplasm Resources Laboratory - White

As a result of the ARS reorganization, the New Crops Research Branch was divided into the Plant Taxonomy, Medicinal Plants, and Germplasm Resources Laboratories. Two elements of the Cereals Branch - Small Grains Collection and International Rust Nursery program - were included with the latter Laboratory. This is the first report of the Germplasm Resources Laboratory.

Two factors have impeded the efficient program of plant introduction and exchange. Mr. H. R. Hanes assumed most of the duties of our capable program specialist, Myra L. Haines, who retired on June 30, 1972, but now two persons are attempting to handle the former responsibilities of three. This fact has delayed P.I. write-ups and Inventory preparation. The retirement of a key editor and curtailment of funds have set back the publishing of the Inventories by an estimated two years. Consideration must be given to alternative computerization and printing of the inventories. These delays are serious in view of the increasing awareness of the need to introduce and preserve valuable germplasm while it still exists and the establishment of special germplasm committees. International problems especially in documentation and preservation of grain legumes (pulses), sorghums, and millets have arisen. The responsibilities of the regional coordinators and state technical committeemen are broadening in these and other germplasm areas.

We have maintained close to our annual average in adding accessions to regional programs. 9,293 accessions were received during calendar year 1972 and included significant groups of (a) forage grasses and legumes from Australia (420); (b) numerous species of vegetables (690) and ornamentals (190) through PL 480 Projects in Yugoslavia, (c) 2,300 small grain cereals, mostly Avena and Hordeum from Israel, Poland and Switzerland and (d) 270 crop varieties from the Soviet Union. Exploration in Iran and Turkey resulted in 1,700 dryland grasses and legumes, including 800 Agropyrons. Experimental stocks sent abroad required 1,100 shipments to 110 countries and an estimated total of 35,000 items. Under a special agreement for servicing AID technical missions, 165 shipments of experimental plant stocks were sent to 33 countries and included 2,208 varieties or species.

Dr. Ian Forbes, Tifton, Georgia, has just completed his survey and collecting for lupines and clovers in Morocco, Tunisia, Spain and Portugal. Approximately 250 accessions were obtained and arrangements set up whereby additional accessions can be obtained from these areas

in the future. Future explorations have been proposed for collecting tomatoes in Latin America, and for crambe in the western Mediterranean area but these were not approved for FY-74. The only domestic exploration activity has been centered with NC-7 whereby the collecting of native grasses from the Dakotas was completed as of June 30, 1972.

The USDA Small Grains Collection has been operative since 1898 and now provides cereal workers internationally with wheat, oats, barley, rye, and Aegilops seed for research. There is a continual and urgent need to obtain seed of the wild and native cultivars of these crops from foreign countries as none of these crops are native to the Western hemisphere. Viable seeds of more than 65,000 entries are now being conserved so that cereal breeders throughout the world, present and future, will have ready access to the genetic diversity needed to develop improved cultivars. The collection is composed of approximately 50% Triticum, 25% Hordeum, 20% Avena, 5% Secale and Aegilops. Annually, more than 150,000 packets of seed are prepared and distributed to researchers throughout the world. The benefits of this collection to basic and applied research are readily acknowledged by cereal crop specialists, public and private, domestic and foreign.

The International Rust Nursery program (IRN) involves wheat and oat nurseries planted at 140 locations in 41 countries. The objectives are (1) to test new and promising selections of wheat and oats to the natural population of rusts around the world and (2) to find new genes or combinations of genes which condition resistance to the population of rust fungi. Cooperators plant, take disease notes, and return the data to the Laboratory for compilation of reports. Entries are rated according to susceptibility to different diseases and desirable entries are incorporated into breeding programs. Plant introductions are screened in the greenhouse for reaction to virulent cultures of stem rust fungi. Selections with good resistance are then placed in one of the nurseries. Entries for the nurseries are obtained primarily from the Small Grains Collection or from other countries. Several countries have made selections from the IRN material which were superior to their own material and made joint releases with the original breeder for commercial production. The ever-changing population of rusts illustrates the necessity for obtaining diversity of rust resistant germplasm in wheat and oats.

Research activities with horticultural crops are divided into two main categories (1) planning of explorations and other methods of expanding germplasm collections of horticultural crops, and (2) evaluation of germplasm collections. An exploration is being planned to collect endemic tomato cultivars in South and Central America and Mexico. PL 480 projects in Yugoslavia continue to yield new collections of horticultural materials. The projects are nearing completion, however, and new projects are not being approved

for the area. The evaluation of germplasm collections is being continued by informal collaboration with four Federal and four Regional Plant Introduction Stations. By direct collaboration with research workers in the Vegetable Development Laboratory, the P.I. collection of eggplant is being screened for resistance to spider mites, flea beetles and Colorado potato beetles. The evaluation of rosemallow hibiscus breeding lines is being continued through informal cooperation at the Glenn Dale Station.

The Forage and Range Research Branch seed room was disbanded July 1, 1972 and contents turned over to Germplasm Resources Laboratory. Stocks consisting of 1,040 accessions of clovers, 30 alfalfa cultivars and 190 accessions of miscellaneous legumes were transferred to other locations for use, increase, and preservation. Germination studies were initiated on selected ground cover species for use by Maryland Highway Administration. Propagation stocks of the Digitaria collection were accrued and increased for screening for yellow sugarcane aphid and winter hardiness. The utilization and checking of documentary information pertaining to introduced germplasm was continued by using ADP techniques.

In the area of new chemurgic crops, new germplasm of Crambe and Limnanthes was added to field programs. B. C. Willingham, Chico Station, collected Limnanthes in northern California. A specific obligation cooperative agreement on agronomic development of Limnanthes with the University of Maryland was approved in late June. This worked coupled with that at Corvallis, Oregon, should permit large scale selection and rapid evaluation of superior types. Based on morphological characteristics and chromosome counts, three accessions of Crambe hispanica including the cultivar 'Indy' have been reidentified as C. abyssinica. Records will be changed this fall. Favorable responses were received from foreign contacts concerning a Crambe exploration next spring. Initial seed yield estimates for Stokesia laevis ranged from 350 to 1160 kg/ha. Unfavorable crop characteristics of S. laevis are slow emergence and the long period between planting and copious seed production. Our studies showed the chromosome number 2n=14 contrasted to 2n=18 in the literature. The researcher who reported n=9 (2n=18) has confirmed our count. Several studies including date of planting row, width x plant population, nitrogen level, and selection within accessions are underway. Kenaf seed stocks are being held at Glenn Dale; their domestic distribution is being coordinated with Dr. Adamson, Savannah.

Publications

Adamson, W. C., G. A. White, and J. J. Higgins. 1972. Variation in leaf development and dry matter yield among kenaf varieties and introductions. Crop Sci. 12:341-343.

Braverman, S. W. and E. E. Leppik. 1972. Origins of cultivated plants and the search for disease resistance. New York's Food and Life Science 5:15-18, 3 maps.

Braverman, S. W. and A. J. Oakes. 1972. Disease resistance in warm-season forage, range, and turfgrasses. The Botanical Review 38:491-544.

Gaskins, M. H., G. A. White, F. W. Martin, N. E. Delfel, E. G. Ruppel, and D. K. Barnes. 1972. Tephrosia vogelii: A source of rotenoids for insecticidal and piscicidal use. U.S. Dept Agr. Tech. Bull. No. 1445.

Hanson, C. H., T. H. Busbice, R. R. Hill, Jr., O. J. Hunt and A. J. Oakes. 1972. Directed mass selection for developing multiple pest resistance and conserving germplasm in alfalfa. Jour. Environmental Quality 1:106-111.

Hyland, H. L. 1972. Plant Inventory No. 178.

Kilpatrick, R. A., L. P. Reitz, and F. A. Jimenez. 1972. Cereal rust nurseries in the Caribbean area, 1950-1972. U.S. Dept Agr. ARS-NE 3, 14 p.

Knight, R. J. and H. F. Winters. 1971. Mango and avocado evaluation in Southeastern Florida. Proc. Fla. St. Hort. Soc. 84:314-317.

Leppik, E. E. 1972. Evolutionary specialization of rust fungi (Uredinales) on the Leguminosae. Annales Bot. Fennici Helsinki, Finland 9:226-239, 6 figs.

Leppik, E. E. 1972. Origin and evolution of conifer rusts in the light of continental drift. Mycopath. et Mycolog. Applicata (The Hague, Netherlands) 44:1-16, 6 figs.

Leppik. E. E. 1972. Post-glacial migration of rust fungi to North Europe. Annales Bot. Fennical (Helsinki, Finland) 9:85-90, 9 maps.

Oakes, A. J. and A. Sierra-Bracero. 1972. Resistance in Digitaria to yellow sugarcane aphid, Sipha flava (Forbes) as related to temperature and rainfall. Jour. Agr. Univ. Puerto Rico 56:33-38.

White, G. A. 1972. New crops on the horizon. Seed World 110 4:20-22.

Winters, H. F. 1972. New Germplasm of ornamental plants from New Guinea. Proc. Trop. Reg. Am. Soc. Hort. Sci. 14:280-284.

Winters, H. F. 1970. New Plant Introductions. Arboretum and Botanical Garden Bul. 4(1):29-32.

Winters, H. F. 1972. Introduction of cudrang or silkworm thorn into the United States. The Am. Hort. Mag. 51(2):6-8.

Discussion

Dr. Jackson asked what was lost in New Crops at Beltsville as a result of reorganization. Dr. White stated that personnel working with medicinal plants and taxonomy of plants was assigned to two other laboratories. Dr. Craddock, previously in Cereals Research Branch, was assigned to the Germplasm Resources Laboratory. One employee retired from the Plant Inspection Station leaving two people to do what three had been doing. More secretarial help, especially for Mr. Hyland, is needed in the Germplasm Resources Laboratory. The Inspection Station has been placed administratively in the Beltsville area, and we would like to transfer its activities to the Agricultural Research Center.

C. National Seed Storage Laboratory - L. N. Bass

In view of the comprehensive report given two years ago Dr. Bass did not prepare a report for this meeting. He reiterated the need for more personnel and financial support to meet the responsibilities of the Laboratory. 84,000 accessions are now stored in NSSL. 6000 samples were distributed because the material requested was not available elsewhere. Manual records compiled during the last 15 years are being converted to automatic cata processing. Records for guar have already been converted. Future inventories will be made from computer printouts.

Dr. Hueg asked how far NSSL is behind with its work; how much backlog is there? Dr. Bass indicated that in addition to the 15 years of manual records to be converted, tests for seed viability even with streamlined procedures have fallen behind.

D. Plant Germplasm Curators

USDA SMALL GRAINS COLLECTION

Plant Genetics and Germplasm Institute
Germplasm Resources Laboratory
J. C. Craddock

The USDA Small Grains Cereal Germplasm Collection is a continuing program since the early 1900's and provides cereal workers internationally with wheat, oats, barley, rye, and Aegilops seeds for research. There is a continual and urgent need to obtain seed of the wild and native cultivated varieties of these crops especially from those areas throughout the world where these crops are indigenous. American cereal breeders depend upon introduced germplasm, as none of these crops are native to the Western hemisphere. The conservation of introduced germplasm of world-wide origin, and having viable seed readily available for distribution at one central location is the most economical and practical way to provide cereal workers with genetic diversity required to develop improved cultivars.

The Small Grains Cereal Germplasm Collection is recognized for the pioneering and persistance in conserving cereal germplasm and for making germplasm readily available to plant researchers. This is the most comprehensive collection in the Western hemisphere and one of the two largest known collections in the world, the other being maintained by the N.I. Vavilov All-Union Institute, USSR. The conservation of cereal germplasm depends upon international cooperation with government agencies and private institutions such as AID, FAS, FAO, N.I. Vavilov All-Union Institute, Izmir Agricultural Research and Introduction Center, CIMMYT, Ford Foundation, etc. The value of this collection to basic and applied research is readily acknowledged by cereal crop specialists, public and private, foreign and domestic.

Viable seed of more than 60,000 entries is being maintained in this collection which is composed of 54 percent Triticum, 25 percent Hordeum, 20 percent Avena, and 1 percent Secale and Aegilops.

Annually more than 150,000 samples (5 grams each) are distributed without charge to research workers for experimental use. About half of these samples are sent to foreign scientists.

Maintaining adequate seed for distribution is important. Seed for approximately 20,000 entries is replenished annually. Nurseries are grown at two locations. A spring-sown nursery is grown at Aberdeen, Idaho. The winter sown and detention nursery for new introductions are grown at Mesa, Arizona.

Each entry is evaluated for characters such as growth habit, plant height, color of kernels, straw, chaff, and awns; and reaction to diseases and insects such as rusts, smuts, viruses, and green bug, cereal leaf beetle, hessian fly, sawfly; and for the nutritional properties that include protein, amino acid, lipids and fats.

An automated data system is used for storing and retrieving information on each accession, preparing varietal lists to accompany seed shipments, and for preparing special listings of all or any portion of the evaluated data.

Status of USDA Rice Collection

A. J. Oakes

The USDA rice collection is currently comprised of 10,170 accessions. This germplasm is stored under controlled humidity and temperature conditions. Exotic germplasm is treated for seed-borne diseases and increased under greenhouse conditions. Paddy rice, Oryza sativa, is prohibited by quarantine regulations from all countries except Mexico. There are no restrictions on the importation of wild rice. Increase seed stocks are supplied to rice researchers throughout the U.S. upon request. An exchange program of rice germplasm with foreign countries is being continued. Rice germplasm is being exchanged with researchers holding collections in the Philippines, two locations in India, Colombia, Japan, and Surinam.

Discussion

Dr. Jackson asked what is a germplasm curator. Dr. Jones replied that anyone who maintains a collection of germplasm is a curator. Dr. Jackson asked if it is possible to introduce seed or plants without them entering the regional programs. Mr. Hyland stated that many items are introduced that do not enter regional programs, and he cited several examples.

Dr. Jackson presented the following list of germplasm holdings which was prepared by the Crop Science Society:

CROP: WHEAT

Location	Numbers of: Genetic & Marker Stocks	Germplasm Items	Comments
Darul Aman Farm, Director-General of Research, Ministry of Agric. & Irrig. Kabul, Afghanistan		1,000	Local (native) varieties.
DEKALB AgResearch, Inc., Wheat Research Dept., Wichita, Kansas 67203		2,500	(Varieties and introductions plus material developed by program).
Department of Agronomy & Range Science, University of Calif., Davis, CA. 95616		200	Varieties and germplasm developed at University of Calif., Davis.
Cargill, Inc., Wheat Research, 2540 E. Drake Road, Ft. Collins, CO. 80521		2,000	Material developed by program.
Foundation Seed Project, Agronomy Dept. Colorado State Univ., Ft. Collins, CO 80521			Foundation seedstocks, primarily small grain.
Plant and Soil Science Dept., Montana State Univ., Bozeman, MT 59715		17	Breeder seed maintenance of varieti developed by Montana Agric. Exp. St
Department of Agronomy & Soils, Washington State Univ. Pullman, WA 99163		5,000	Wheat working stocks and species.
The Ford Foundation, P. O. Box 2379, Beirut, Lebanon		3,000	Lebanese, CIMMYT, & FAO. Co-operate closely.
Jenkins Foundation for Research, 330 Maple Street, Salinas, CA 93901		500	
Cereal Rust Laboratory, University of Minnesota, St. Paul, MN 55101	84		Wheat differentials for rust.
Department of Agronomy, Curtis Hall University of Missouri, Columbia, MO 65201	400		Wheat genetics and aneuploids.
Dept. of Agron. & Plant Genetics, USDA, University of Minnesota, St. Paul, MN 55101		400	Breeding lines.
Dept. of Agronomy, Clemson University Clemson, SC 29631		75	Breeding material.
Dept. of Plant Sciences, Univ. of Calif. Riverside, CA 92502		2,200	Wild species of Triticum and Aegilo
Agric. Research & Educ. Center, P.O.Box 470, Univ. of Florida, Quincy, FL 32351		200	C.I. and breeding lines.
Dept. of Agronomy, Purdue University, Lafayette, IN 47907		23	15 varieties, 1 germplasm release, 7 rust differentials.
Funk Bros. Seed Co., International Headquarters, 1300 W. Washington St., Bloomington, IL 61701			Breeding material
Cereal Laboratory, Indian Agric. Res. Institute, New Delhi-12, India			Wheat material.

CROP: COTTON

Location	Numbers of: Genetic & Marker Stocks	Numbers of: Germplasm Items	Comments
Department of Soil & Crop Sciences, Agronomy Field Laboratory, Texas A&M Univ., College Station, TX 77843		600	Asiatic species.
Department of Soil & Crop Sciences, Agronomy Field Laboratory, Texas A&M Univ., College Station, TX 77843	200		Markers of G. hirsutum.
Department of Soil & Crop Sciences, Agronomy Field Laboratory, Texas A&M Univ., College Station, TX 77843	30		Species of Gossypium.
Department of Soil & Crop Sciences, Agronomy Field Laboratory, Texas A&M Univ., College Station, TX 77843		600	Races of G. hirsutum.
Department of Soil & Crop Sciences, Agronomy Field Laboratory, Texas A&M Univ., College Station, TX 77843	100		Collection of primitive stocks of G. hirsutum.
Delta Branch Experiment Station, Stoneville, Mississippi 38776		800	Regional germplasm stocks.
West Tennessee Agric. Expt. Station, 605 Airways Boulevard, Jackson, TN 38301		10	Varieties and strains developed by Experiment Station.
Univ. of Arizona Cotton Res. Center, 4207 E. Broadway, Phoenix, AZ 85040		275	G. barbodense.
Department of Agronomy & Soils, 238 Fonchess Hall, Auburn Univ., Auburn, AL 36830	2		Auburn BRI & BRZ cotto
Indian Agric. Research Institute, Sub-Station, Coimbatore, Tamil Nadu, India			Cotton material.

CROP: SORGHUM

Ft. Hays Branch Experiment Station, Hays, Kansas 67601		40	Germplasm stocks.
Department of Agronomy, Oklahoma State Univ., Stillwater, OK 74074		500	Breeding project.
U.S. Sugar Crops Field Station, Route 10, Box 152 Maridian, Mississippi 39301		3,000	Sweet sorghums
Department of Soil & Crop Science Texas A&M Univ., College Station, TX 77843	260		Sorghum genetic stocks.
Agricultural Experiment Station, Univ. of Tennessee, Knoxville, TN 37901		3	Breeder's seed - Cumberland sudangrass.
Director, Purdue-AID Sorghum Project, Dept. of Agron., Purdue Univ., W. Lafayette, IN 47907		46	High protein and quality.
Department of Agronomy, Univ. of Nebraska, Lincoln, NB 68503		300	Varieties and lines.

CROP: SORGHUM

Location	Numbers of: Genetic & Marker Stocks	Germplasm Items	Comments
Asgrow Seed Company, P. O. Drawer A, San Antonio, TX 78211		8,000	Breeding lines.
Department of Agronomy, Colorado State Univ., Ft. Collins, CO 80521		2	Restorer lines.
DEKALB Sorghum Research, Rt. #2, Lubbock, TX 79415		15,000+	Breeding lines.
Department of Agronomy & Plant Genetics, University of Arizona, Tucson, AZ 85721		500	Breeding material and lines.
Department of Soil & Crop Sciences, Texas Agric. Expt. Sta., Texas A&M Univ., College Station, TX 77843		723	Old and new varieties.
Pioneer Sorghum Research Center, Pioneer Hi-Bred Company, Box 788 Plainview, TX 79072		7,000	World Sorghum Collection amd breeding populations.
Maize Research Center, Box 450, Kitale, Kenya		50	Breeding populations
Southern Grain Insects Research Laboratory, U. S. Dept. of Agric., Tifton, Georgia 31794		90	Released varieties
All-India Coordinated Rice Improvement Project, Rajendranager, Hyderabad-30, India			Sorghum material.

CROP: CORN

Department of Plant Pathology, 242 Davenport Hall, Univ. of Illinois, Urbana, IL 61801	300		Disease resistant stocks.
Committee of Agric. Development, 112 Agronomy Bldg., Ames, IA 50010	23		Genetic stocks.
Moews Seed Company, P. O. Box 277, Granville, IL 61326			Breeding material, station releases.
Department of Horticulture, University of Hawaii, Honolulu, Hawaii 96822	200		Breeding and mutant lines.
DEKALB AgResearch, Inc. Research Center, DeKalb, IL 60115		1,500	Open-pollinated varieties and populations.
Department of Agronomy, Agric. Expt. Sta., Purdue University. W. Lafayette, IN 47907		40	Inbreds
Maize Research Center, Box 450, Kitale, Kenya		50	Breeding populations.
Pioneer Hi-Bred International, Johnston, IA 50131		2,500	Breeding stocks.

CROP: CORN

Location	Number of: Genetic & Marker Stocks	Number of: Germplasm Items	Comments
Funk Seeds International, Inc. 1300 W. Washington St., Bloomington,IL 61701			Breeding material.
Department of Agronomy, Mississippi State Univ., Box 5248, State College, MS 39762		18	Inbreds and open-pollinated varieties.
Germplasm Institute, Agr. Res. Center -W, 126 So. Bldg., Beltsville, MD 20705		50	Inbred lines.
Illinois Foundation Seeds, Inc., P.O. Box 722, Champaign, IL 61820.		1,000	Breeding material and lines
Department of Agronomy, Univ. of Wisconsin, Madison, WI 53706		1,500	Varieties and lines for northern cornbelt.
Southern Grain Insects Research Laboratory, U.S. Dept. of Agric., Tifton, Georgia 31794		90	Released varieties - some sweetcorn lines.
Department of Agronomy, University of Nebraska, Lincoln, NB 68503		100+	Exotic and cornbelt stocks.
Statistics Dept., North Carolina State Univ., P. O. Box 5457, Raleigh, NC 27607		1,000	Latin American races.
Ohio Agric. Research & Development Center, Dept. of Agron., Wooster, Ohio 44691		40	Inbred lines.
Connecticut Agric. Experiment Station, Box 1106 New Haven, CT 06504		6	Inbred lines released by D. F. Jones.
Pee Dee Experiment Station, P. O. Box 271, Clemson University, Florence, SC 29501		20	Inbreds and synthetics.
Trojan Seed Co. Olivia, Minnesota 56277		750	Inbred lines, synthetics and open-pollinated varieties.
Cargill Grinnell Research Center, Box 359, Grinnell, IA 50112	60		Tropical material including nine races.
Regional Plant Introduction Station ARS, Ames, IA 50010.		110	80 open pollinated varieties; 30 synthetics.
Missouri Agric. Expt. Station, 109 Curtis Hall, Columbia, MO 65201			(same as above)
Department of Agronomy, S-116 Turner Hall, Univ. of Illinois, Urbana, IL 61801	3,047		Markers, chromosomal aberrations, and "new" traits.
Department of Crop & Soil Science, Michigan State Univ., E. Lansing MI 48823		20	Inbred lines.
Tennessee Agricultural Experiment Station, Univ. of Tenn., 350 Plant Science Bldg., Knoxville, TN 37916		200	Lines and breeding populations.
Department of Agronomy, S-116 Turner Hall Univ. of Illinois, Urbana, IL 61801		100	Varieties and synthetics.
Department of Plant Breeding, Cornell Univ., Ithaca, NY 14850		2	New broad-based populations.
R.I. Agric. Expt. Station, Dept. of Plant & Soil Science, Univ. of R.I., Kingston, R.I 02881		1	Flint corn-double white cap.

CROP: CORN

Location	Number of: Genetic & Marker Stocks	Germplasm Items	Comments
Asgrow Seed Company, Kalamazoo, Michigan 49001		1,000	Breeding material & lines.
Department of Horticulture, Penn. State Univ., 103 Tyson Bldg., Univ. Park, PA 16802	100		Various mutants in several backgrounds.
Plant Science Department, Univ. of New Hampshire, Durham, NH 03824		60	Blight resistant lines and early ornamental lines.
Department of Agronomy, Iowa State Univ., Ames, IA 50010		500+	Inbreds, synthetics and open-pollinated varieties.
Department of Plant Breeding, Cornell Univ., Ithaca, NY 14850	380	120	Mutant stocks, lines and varieties.
L. Teweles Seed Co., Research Center Route #1, Clinton, WI 53525		5,000	Multiple-eared lines.

CROP: TOBACCO

Oxford Tobacco Research Laboratory Oxford, NC 27565		1,200	Species and introductions
Tobacco Introductions & Cultivars, Agric. Research Center-West, Beltsville, MD 20705		1,593	1,080 introd.; 63 species; 450 cultivars.
Department of Agronomy, Univ. of Maryland, College Park, MD 20742		9	Maryland cultivars (type 32) released varieties.
Virginia Polytechnic Instit. & State Univ., 334 Smyth Hall, Blacksburg, VA 24061		10	Released varieties.
Agric. Research & Educ. Center, P. O. Box 470, Quincy, Florida 32351		1,000	Cigar-wrapper stocks.
Crop Science Department, North Carolina State Univ., 429-A Williams Hall, Raleigh, NC 27600		500	Breeding lines, varieties and genetic stocks.
Department of Agronomy, University of Kentucky, Lexington, KY 40506		150	Breeding stocks.
Tobacco Laboratory, Genetics & Germplasm Institute, Agric. Res. Center, Beltsville, MD 20705		1,500	Introductions and varieties.

CROP: OATS

Location	Number of: Genetic & Marker Stocks	Number of: Germplasm Items	Comments
Plant and Soil Science Dept., Montana State University, Bozeman, MT 59715		5	Foundation seed
Agric. Research & Educ. Center, Univ. of Florida, Box 470, Quincy, FL 32351		500	Breeding material and varieties.
Dept. of Agronomy, No. Center, Purdue Univ., W. Lafayette, IN 47907		14	Foundation seed.
Dept. of Agron. & Soils, Washington State Univ., Pullman. WA 99163	300		Genetic stocks
Cereal Rust Laboratory, Univ. of Minnesota, St. Paul, MN 55101		9	Disease differentials.

CROP: SOYBEANS

Campbell Institute for Agric. Research, 2611 Branch Pike, Riverton, NJ 08077		250	Breeding lines and cultivars.
Delta Branch Experiment Station, Soybean Research Program, Stoneville, MS 38776		1,200	Maturity 0° to 38° latitude
Soybean Investigations, Oilseeds, PSRD, USDA, 222 So. Bldg., P. I. Station, Beltsville, MD 20705		79	Cultivars & breeding lines.
U. S. Regional Soybean Laboratory 160 Davenport Hall, Univ. of Illinois, Urbana, Illinois 61801		3,000	Germplasm 00 to IV
USDA-Purdue University Agric. Expt. Station Dept. of Agron, Purdue Univ. W. Lafayette, IN 47907		500	Lines and breeding material.
L. Teweles Seed Co., Research Center, Route #1, Clinton, WI 53525		15,000	F_3 lines.

CROP: RICE

Rice Experiment Station, Crowley, Louisiana 70526		7,000	Old and new cultivars, genetic stocks.
ARS, USDA, Agronomy Department, Univ. of California, Davis, CA 95616		1,000+	Varieties and lines.
All-India Coordinated Rice Improvement Project, Rajendranagar, Hyderabad-30, India			Rice material.
International Rice Research Institute, P. O. Box 583, Manila, Philippines		17,000	Rice cultivars and O. glaberrima and wild taxa.

CROP: CLOVER

Location	Number of: Genetic & Marker Stocks	Number of: Germplasm Items	Comments
Department of Agronomy, Univ. of Kentucky, Lexington, KY 40506		900	180 species with 5 accessions each.
Crops Research Lab, ARS-USDA, Colorado State Univ, Ft. Collins, CO 80521		1	Zigzag clover.
Plant Physiology Institute, USDA, ARS, 229 Soils Bldg., P. 1. Station, ARC-West, Beltsville, MD 20705		500	145 species.
Plant Physiology Institute, USDA, ARS, 229 Soils Bldg., P. I. Station, ARC-West, Beltsville, MD 20705		215	Clover cultivars and special purpose legumes.
Agronomy Dept., South Carolina Agric. Expt. Station, Clemson, SC 29631		55	White clover germplasm and closely related species.

CROP: BARLEY

Department of Agronomy, Univ. of Minnesota, St. Paul,MN 55101		250	Disease, genetic and agronomic stocks.
Plant and Soil Science Dept., Montana State Univ., Bozeman, MT 59715		11	Foundation seed.
Department of Agronomy & Soils, Washington State Univ., Pullman, WA 99613			Breeding material.
Department of Agronomy, Ohio State Univ., & Ohio Agric. Res & Development Center, 1885 Neil Ave., Columbus, OH 43210		1	Foundation seed.
Plant and Soil Science Dept., Montana State Univ., Bozeman, MT 59715		150	Spring barley and genetic male-steri stocks.
Agric. Res and Educ. Center, Univ. of Florida, P. O. Box 470, Quincy, FL 32351		200	Breeding material and varieties.
Department of Agronomy, No.Center, Purdue Univ., W. Lafayette, IN 47907		4	Released varieties - winter barley.
Department of Agronomy, Colorado State Univ., Ft. Collins, CO 80521	2,000+		Genetic stocks; trisomics and other aneuploids.
Department of Agronomy & Range Science, Univ. of California, Davis, CA 95616		10+	Composite crosses.
Indian Agricultural Research Institute, New Delhi-12, India			Barley material.

CROP: VEGETABLES

Department of Agronomy, Univ. of Wisc., Madison, WI 53706		200	Introds., cutlivars and breeding lines of Pisum.
U. S. Vegetable Breeding Laboratory, Box 3348, Charleston, SC 29407		600	Breeding lines and introd. of bush snap beans.

CROP: VEGETABLES

Location	Number of: Genetic & Marker Stocks	Number of: Germplasm Items	Comments
Dept. of Vegetable Crops, New York State Agric. Expt. Station, Cornell Univ., Geneva, NY 14456		3,000+	Various breeding material and varieties.
John Innes Institute, Colney Lane, Norwich, NOR 70F, Norfolk, United Kingdom.		1,000	Cultivars and "wild" forms of Pisum.
Campbell Institute for Agric. Research Pioneer Lab., Riverton, NJ 08077		1,250	Common bean lines and cultivars.
U. S. Agricultural Research Station, Box 5098 Salinas, California, 93901		1,000	Lettuce lines.
Basic Vegetable Products, Inc. Box 599, Vacaville, CA 95688		32	Allium cepa material.
FMC Corporation, Niagara Chemical Div., Seed Department, El Macero, CA 95618		10,000	Various vegetable seeds.
Agric. Research & Educ. Center, Univ. of Florida, 5007-60th St. East, Bradenton, FL 33505		4,000	Lycopersicon spp.
Campbell Institute for Agric. Research, 2611 Branch Pike, Riverton, NJ 08077		12	Private varieties.
Horticultural Department, Indian Agric. Research Institute, New Delhi-12, India			Vegetable crops.

CROP: RYE

Jenkins Foundation for Research, 330 Maple Street, Salinas, CA 93901		100	Breeding material
Seed Development Commission, Seed Tech. & Development Center, Whitehall Road, Athens, GA 30601.		10	Southern varieties.
Agric. Research & Educ. Center, Univ. of Florida, P. O. Box 470, Quincy, FL 32351		50	Breeding material and cultivars.

CROP: ALFALFA

Waterman-Loomis Co., Western Research Center, 601 Oswell St., Bakersfield, CA 93307			Breeding material and proprietary varieties.
Department of Agronomy, Purdue Univ., Lafayette, IN 47907		2	"Culver" variety and Syn. C.
Department of Agronomy, Univ. of Arkansas, Fayetteville, AR 72701.		3	Cultivars.

CROP: ALFALFA

Location	Number of: Genetic & Marker Stocks	Number of: Germplasm Items	Comments
L. Teweles Seed Co., Research Center, Route #1, Clinton, WI 53525		15,000	Lines, syn. and male-sterile hybrids.
Agronomy Dept.,Univ. of Wisconsin, Madison, WI 53700		10	Diploid and hexaploid varieties.
Agronomy Department, Univ. of Nebraska, Lincoln, NB 68503		56	Germplasm releases and standard clones.
Arnold-Thomas Seed Service, Box 2345, Fresno, CA 93721		20,000	Breeding material and varieties.
Agronomy Dept., Va. Polytechnic Institute, and State Univ., Blacksburg, VA 24061			Some genetic traits in diploid and hexaploid forms.
Rhode Island Agric. Expt. Sta. Dept. Plant & Soil Science, Univ. R.I., Kingston, R.I. 02881		1	Narragansett variety.

GENERAL

U.S.D.A. Cotton Research Station, 17053 Shafter Ave., Shafter, CA 93263		5,000	Safflower germplasm.
Agronomy & Plant Genetics, Univ. of Minnesota, St. Paul, MN 55101		2,600	Flax breeding material.
Dept. of Botany & Plant Pathology, Oregon State Univ., Corvallis, OR 97331		450	Hop breeding material.
U. S. Sugar Corporation, Research Dept., P. O. Drawer 1207, Clewiston, FL 33440		180	Sugarcane stocks.
USDA Soil Conservation Service, Plant Materials Center, Route 1, Box 81, Bridger, MT 59014		1,000	Native species endemic to area.
Dept. of Agronomy & Plant Genetics, Univ. of Minnesota, St. Paul, MN 55101		1	Reed canarygrass genetic pool.
Agronomy Field Laboratory, Texas A&M Univ., College Station, TX 77843		500	Sunflower breeding material and lines.
Plant and Soil Science Department, Montana State Univ. Bozeman, MT 59715		2	Sainfoin cultivars.
Plant and Soil Science Department, Montana State Univ., Bozeman, MT 59715		2	Grass cultivars.
Jenkins Foundation for Research 330 Maple Street, Salinas, CA 93901		1,500	Triticale breeding lines.
International Institute of Tropical Agric., PMB 5320, Ibadan, Nigeria		3,630	Cowpea varieties and introductions.

GENERAL

Location	Number of: Genetic & Marker Stocks	Number of: Germplasm Items	Comments
Department of Agronomy, Oklahoma State Univ., Stillwater, OK 74074		5,000	Various species, cultivars and introductions.
Holly Sugar Corporation, Agric. Research Dept., P. O. Box 764, Sheridan, WY 82801		2,500	Sugar beet seed.
Agronomy and Range Science Dept., Univ. of Calif., Davis, CA 95616		150	Flax material.
Coastal Plain Expt. Station, ARS. USDA, Box 748, Tifton, GA 31794		7,000+	Peanut breeding lines.
AMSTAR, Corp., Spreckles Sugar Div., P. O. Box 428, Spreckles, CA 93962		3,000	Sugarbeet material.
Agronomy Department, Oklahoma State Univ., Stillwater, OK 74074		700	Cynoden and Bothrochloa sps.
Department of Agronomy, Univ. of Arkansas, Fayetteville, AR 72701		25	White lupinus.
Department of Agronomy, Univ. of Arkansas, Fayetteville, AR 72701		12	Lespedeza material.
Dept. of Botany & Plant Pathology Oregon State Univ., Corvallis, OR 97331		450	Hop breeding material.
Sugarcane Field Station, Box 156, Canal Point, FL 33438		1,500	Sugarcaneworld collection
Potato Introduction Station Sturgeon, Bay, WI 54235		3,500	Wild and cultivated potatoes and genetic stocks.
Georgia Coastal Plain Experiment Station, USDA, ARS, Tifton, GA 31794		400	Bermudagrass material.
Northern Great Plains Research Center, Box 459, Mandan, ND 58554		30	Forage grasses; various species.
U. S. Plant Introduction Station, Route 4, Box 433, Savannah, GA 31405		200	Kenaf and roselle cultivars and lines.
Dept. of Ornamental Horticulture, P. O. Box 1071, Univ. of Tennessee, Knoxville, TN 37901			Sod of Tennessee Hardy Centipedegrass.
North Carolina Experiment Station, N.C. State Univ., Box 5155, Raleigh, NC 27600		10,000	Peanut mutants, cultivars and introductions.
U.S. Vegetable Breeding Laboratory, Box 3348, Charleston, SC 29407		150	Sweetpotato introd. and breeding material.
Department of Plant Pathology, Oregon Station Univ., Corvallis, OR 97331		680	Mentha species and strains.
Better Lawn & Turf Institute, Rt. 4, Kimberdate, Marysville, OH 43040			Turfgrass varieties and selection.

GENERAL

Location	Number of: Genetic & Marker Stocks	Number of: Germplasm Items	Comments
Georgia Coastal Plain Experiment Station, USDA, ARS, Tifton, GA 31794		1,000+	Pearl millet breeding material and cultivars.
U. S. Sugarcane Field Station, P. O. Box 156, Canal Point, FL 33438		3,200	Saccharum and related species.
Plant Genetics & Germplasm Institute, P.I. Station, USDA, ARS, Beltsville, MD 20705			Peanut stocks.
Agricultural Research Center, Ona, FL 33865		200	Digitaria and Hemarthia material.
Agricultural Res. & Educ. Center, Univ. of Florida, P.O. Box 470, Quincy, FL 32351		50	Triticale material.
Department of Agronomy, Purdue Univ. Lafayette, IN 47907		12	Crambe varieties and introductions.
Maize Research Center, Box 450, Kitale, Kenya			Millet synthetic varieties.
Indian Agricultural Research Institute, New Delhi-12, India			Maize material.
Indian Agricultural Research Institute, New Delhi-12, India			Pulses.
Indian Agricultural Research Institute, New Delhi-12, India			Oilseeds.
Indian Agricultural Research Institute, New Delhi-12, India			Millets.
Horticultural Dept. IARI, New Delhi-12, India			Ornamental.
Plant Introduction Division, IARI, New Delhi-12, India			Medicinal.
Indian Institute of Horticultural Research, 255, Upper Palace Orchard, Bangalore, Mysore.			Temperate Fruits.
Indian Institute of Horticultural Research, 255, Upper Palace Orchard, Bangalore, Mysore.			Tropical Fruits.

NEW CROPS BRANCH OF U.S.D.A.

Plant Science Research Division
Beltsville, MD 20705
Agric. Research Service: New Crops Research Branch
Plant Introduction Investigations
Plant Materials Investigations - Agronomic Crops
Chemurgic Crop Investigations
Plant Materials Investigations - Horticultural Crops

NEW CROPS BRANCH OF U.S.D.A.

North Central Regional Project NC-7, Ames, IA 50010

Northeastern Regional Project NE-9, Geneva, NY 14456

Southern Regional Project S-9, Experiment, GA 30212

Western Regional Project W-6, Pullman, WA 99163

Inter-Regional Potato Project IR-1, Sturgeon Bay, WI 54235

Cooperative State Research Service, Washington, D.C. 20000

NATIONAL SEED STORAGE LABORATORY

National Seed Storage Laboratory, Colorado State University,
Fort Collins, Colorado 80521

EUROPEAN CENTERS

Institut fur Pflanzenbau und Saatgutforschung
der Forschungsanstalt und Landwirtschaft,
33 Braunschweig, - Volkenrode
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V. REPORTS FROM THE REGIONAL STATIONS

A. NC-7 PROGRESS REPORT TO NATIONAL COORDINATING COMMITTEE

W. H. Skrdla
Ames, Iowa

October 15-16, 1973
National Arboretum
Washington, D. C.

A. Station facilities

1. The highlight of station facility improvement occurred in the seed room. For many years, the temperature in the seed storage room has been kept at about 42°F. At this temperature, the relative humidity remained at about 70-75% in the summer and about 70% in the winter. This is a higher level of humidity than we wanted and little had been done to control it. We wanted to lower it to less than 50% without increasing the temperature.

   The 42 degree temperature has kept insects under control and eliminated the need for using insecticide or repellants of any kind. Since we fill from 10,000 to 15,000 seed packets every year, we eliminate a significant health hazard by not having to use insecticides. Therefore, I did not wish to raise the temperature very much, if any.

   It was suggested to us that we use a rheostat for the unit coolers to reduce fan speed and thereby slow down the air as it passes through the coils. This could result in extraction of more moisture from the air. We have two unit coolers, so the two rheostats would cost about $60.00.

   We installed these rheostats and operate the motors at about 50 percent voltage. This provided partial control but it was not adequate and the peaks and valleys on the hygrothermograph chart were too large to be satisfactory. The engineers recommended that we add heat to the room so we temporarily placed an electric room heater in the room. This did not help much. They then suggested that we leave our ceiling lights burning day and night. This helped considerably and we now have 12 200-watt bulbs burning in the seed room 24 hours a day. The temperature remains at 42°F and the RH is now down to 40-45 percent (from 70-75 percent or more). This is a much more satisfactory condition than we previously had and was attained at a cost of less than $100.00.

B. Introductions received and packets distributed

In 1971 and 1972, we received seed of 1,430 new introductions and plants of 140 ornamental accessions. During the same time, we distributed 21,100 packets of seed and 3,370 ornamental plants for a total distribution of nearly 24,450 items. Most of the ornamental plants were sent to 30 test sites in the North Central Region for evaluation. We now have more than 17,000 active introductions, over 15,000 of which are available for distribution.

C. Seed collections received during 1971-72

Several major collections were received during the past two years. One was a large collection of seed of ornamental plants collected in Siberia by J. L. Creech. Plants are being established from seed and will be evaluated at the station and later in regional trials.

Another is a tomato collection received from Dr. C. M. Rick. This is mostly material he collected in the wild in Peru and Ecuador and consists of wild species as well as Lycopersicon esculentum. More than 150 accessions were received to date.

A third collection was received from Dr. H. T. Erickson of Purdue University. This is a collection of L. esculentum that he made in Brazil. About 70 accessions were received.

We also received sizable collections of the following crops from Yugoslavia: (1) Beta vulgaris, (2) Cucumis sativus, (3) Cucurbita pepo, (4) Daucus carota, (5) L. esculentum, (6) Petroselinum crispum, and (7) Spinacea oleracea.

D. Domestic Exploration

1. Alaska collection. While the exploration phase, as sponsored by NC-7, has been completed for several years, activity still remains in evaluation and seed increase of the material. PI numbers are being assigned as more material is increased in Alaska and made available to the Regional Program. Seed is sent to the western region for preservation and plantings for observation and evaluation are made at the NC-7 station.

2. South Dakota Native Grasses. The exploration phase was terminated on June 30, 1972 but evaluation, selection and seed increase work continues at South Dakota. Attention was given to methods of preserving these collections by the NC-7 Forage Crops Subcommittee. Since native grasses can remain viable for a period of 40 years, placing increase seed with the National Seed Storage Laboratory was recommended. While this kind of preservation stops further crossing and evolution under natural conditons, the original germplasm can be preserved. Other methods of preservation are still under consideration.

3. Exploration for Native Pecans. This work was begun on July 1, 1972 for a two year period, ending June 30, 1974. However, this was extended for another three year period by action of the NC-7 Fruit Crops Subcommittee and Technical Committee which met during the week of September 24, 1973.

   Collections are being made in Missouri, Illinois, Kansas, and Iowa. Many trees have been located and nuts will be harvested this year. Many desirable nut characteristics are being sought. There is also a search for lumber type trees because of their desirability in making veneer.

Some of the best collecting sites have been found in areas of the confluence of three rivers. This was observed in several states. The reason for this is not known except that nuts may have been carried downstream and deposited in silt beds during periods of flood. Pecan nuts will not germinate unless they are buried about 2" by man, squirrels, or siltation. This specific germination requirement severly restricts the natural spread of trees. In addition, pecan trees prefer low lying sites, like along river valleys for best growth and performance.

E. NC-7 Subcommittee meetings.

During the week of September 24, the NC-7 Subcommittees for Fruits Crops and Ornamentals met at the Ohio Agricultural Research and Development Center, Wooster, just prior to the Technical Committee.

The Ornamentals Subcommittee discussed evaluation work and reporting procedures. They also prepared a plant list of materials and suggested sources to help guide the input of new ornamental materials into the program. This is in addition to ornamental plant introductions entering the program from various sources, including collections from Siberia made by J. L. Creech and those from Yugoslavia through the PL 480 program.

The Fruit Crops Subcommittee expressed concern about closing the Chico Plant Introduction Station, especially on such short notice. This placed a heavy burden on State fruit breeders who wished to help preserve various fruit collections. It necessitated a quick realignment of their programs in order to accomodate these collections.

The Subcommittee worked on a list of fruit material desired from China, Russia, and other far East countries. This list will be put into final form and forwarded to the Germplasm Resources Laboratory for use when the opportunity to collect in these areas arises.

Also, the subcommittee deliberated possible means of preserving clonally propagated fruit material. There will be more to report on this later.

The Forage Crops Subcommittee met in 1972, primarily to discuss work with plant introductions at the various stations in the region and also to consider ways of preserving the South Dakota collection of warm season cross pollinated grasses.

The Industrial Utilization Subcommittee plans to meet at Purdue University in the spring of 1974. Progress in new crops development will be considered. They also hope to see breeding work underway at Purdue on new crops, especially on Crambe and Vernonia.

F. Automatic Data Processing Program

We now have all our primary maintenance grasses, corn, and alfalfa in the ADP system. We hope to add additional crops during the next year. The system has been very useful to us and for those requesting seed from us. We have sorted our collections for various traits for our own use and have sorted them for traits to assist others in their search for specific ones.

G. Increasing Original Seed of Alfalfa Introductions by Controlled Pollination

This proposal, which I discussed at the 1971 National Coordinating Committee meeting, involves the assistance by alfalfa breeders to help increase original seed of alfalfa introductions by controlled pollination in order to maintain a nucleus of unmixed original seed for special breeding work and for future first generation open pollinated seed to be used for general distribution. We have had good cooperation by alfalfa breeders. About 100 accessions have been increased or are presently under increase. This has helped us salvage small quantities of old original seed that could have been lost in the near future.

H. Seed and plant distribution during the 10 year period, 1963-1972

Figure 1 is presented to show the activity in distribution of seed packets and plants during the ten-year period, 1963-1972. Most of the plants were used in the North Central Region but about 1,000 were sent to miscellaneous locations outside the region. The total number of packets and plants distributed during that period is about 102,900, for an average of nearly 10,300 per year. No definite trend one way or another is evident during that ten-year period. Annual distribution varies above or below the average.

I. The Alaska Plant Materials Center

A new Plant Materials Center was recently established by the State of Alaska. Because of the unique conditons of climate in that state as compared to the 48 contiguous states, there is a need for a germplasm center at that latitude to increase and evaluate plants, including plant introductions, under their conditons. Day length sensitive plants from the far north latitudes do not always perform well or set seed under our conditions. The new center is a state function and if state appropriations are obtained, foreign plant explorations will be made in polar arctic and possibly antarctic areas. The objectives of the new center are similar to those of the Regional Plant Introduction stations except that it is a state function and not regional in scope. There will be cooperation with the NC-7 program. At the recent NC-7 Technical Committee meeting, support of the facility (non-financial) and assistance with their work was pledged. The Plant Materials Center will be located in the Matanuska Valley near Bodenburg Butte. An article about this center appears in the July 1973 issue of Agroborealis, titled The Alaska Plant Materials Center -- A New Institution, by C. E. Logsdon, Associate Director of the Station.

J. Evaluation Activities at the Regional Station

1. Entomology

a. Pepper introductions were evaluated in the field for resistance to larvae of the European corn borer. In separate work conducted in connection with this evaluation program, results showed that the most important factor influencing resistance to the borer appears to be pungency. When artificial capsaicin, the pungent principle in hot peppers, was incorporated into a diet and fed to newly hatched larvae, survival was greatly reduced, to as low as 0.062%.

Because of this development, further screening work was limited to sweet peppers only. However, all that were tested to date were susceptible.

b. Peppers were also screened in the greenhouse for green peach aphid resistance, but all were susceptible.

c. Corn introductions are being evaluated in the field for resistance to second generation larvae of the European Corn Borer. Plants with eight or fewer cavities per plant are considered to be of sufficient resistance to evaluate further. Thirty three introductions with eight or fewer cavities per plant were found in 1972. Of these, four had eight or fewer cavities per plant in both 1971 and 1972 and all are open pollinated varieties from Kansas. They are:

222612	Late White Composite #6
222614	Midland Yellow
222631	Labeth Co. Yellow
222643	Commercial White

None of the other 33 introductions showing potential resistance in 1972 were screened in 1971.

d. An unidentified lepidopterous larva was noted damaging the tubers of Helianthus annuus x H. tuberosus. Specimens were identified as Eucosma womonana. This is a native insect of no known economic importance. There are only three references to it in the literature, all of a taxonomic nature.

2. Ornamentals

Ornamental introductions from the Skrdla-Brooks expedition to the USSR and from other sources and expeditions, as indicated, were evaluated at the Regional Station. Results for 1971 and 1972 are given below.

a. Regional Station Trial, 1971 observations

342925 - Alnus pendula. Japan. Plants failed to overwinter.

316616 - Cornus controversa. Korea. Plants here have relatively very few leaves.

323959 - Cornus mas. Stavropol U.S.S.R. A few seedlings surviving and show promise here.

325250 - Cornus alba. Siberia. Plants failed to overwinter.

325253 - Cornus sanguinea. Caucasus, Crimea. Differences in bark color noted.

325254 - Cornus walteri. China. A late (mid-June) flowering introduction.

269293 - Cotoneaster dammeri 'Skogsholmen'. Borderline hardy here. Branches on ground flower while those above are killed.

325271 - Cotoneaster microphylla. Hardy herbarium specimens taken for re-identification.

309681 - Cotoneaster obscura. Italy. Sprouts from base - 3' stems dead.

316967 - Forsythia ovata. Korea. Flower buds lack hardiness here.

324986 - Hypericum sp. Taiwan. Failed to overwinter.

38807 - Ligustrum quihoui. China. Accession failed to overwinter.

325361 - Ligustrum vulgare. Stavropol region. U.S.S.R. Apparently hardy, potentially good hedging plants in this accession.

323718 - Lonicera involucrata. Hanna, Utah. Hardy, flowers, fruits and foliage is clean and lasts all season.

303579 - Rosa sp. Colorado. Early (mid-May) flowers.

b. Distribution of Plants to Regional Trial Cooperators Table II shows 14 items totalling 1,359 plants in addition to miscellaneous introductions of 290 plants were shipped from the Regional Station. Of the 14 items offered to regional trial cooperators, nine species (4 trees, three trees, one shrub, and a perennial forb species available as seedlings. Three of the 14 trial species are from the Nebraska-Viehmeyer domestic collections.

c. Regional Station Trial, 1972 observations

(1) Introductions with Good Performance

PI 303182 Amorpha fruticosa, USA

PI 323957 Aronia melanocarpa, USSR, leaves, fruit and plant larger than type

PI 130480 Betula utilis, China, short, small trees

PI 313962, 325269, 325270 Cotoneaster lucida, USSR

PI 313964 Cotoneaster racemiflora, USSR

PI 371883 Dianthus bicolor, USSR range of foliage colors

PI 325361 Ligustrum vulgare

PI 325362 L. v., diverse shrub types

PI 325000 Lilium philippinense formosanum, Taiwan, short with large flowers

PI 267114 Lonicera caerulea, plant #33, Japan

PI 316409 Lonicera insularis, Korea

PI 266678 Populus tremula erecta, Holland

PI 369303 Potentilla fruticosa, USSR, narrow, with dark foliage

PI 265667 Salix repens rosmarinifolia, Germany

PI 341750 Ulmus carpinifolia Hoersholminensis, Holland

(2) Introductions with Poor Performance

PI 325271 Cotoneaster nitens Rehd & Wilson, susceptible to fireblight, apparently hardy

PI 323964 Crataegus mollis, growth good but susceptible to diseases and insects

PI 303265, 303267, 303272, 303273, 303274 Cupressus arizonica, 29 two year plants failed to over-winter

PI 303555 Rhus trilobata Pilosissima, winter injury

PI 112116 Ulmus pumila pilosa, severe over-winter stem breakage

PI 286570 Weigela hortensis, Japan, suffruticose, weak stems

(3) New introductions

Seed of several herbaceous and woody perennials have been received from Yugoslavia and USSR-Siberia. These are the product of PL 480 work in Yugoslavia and Dr. Creech's trip to parts of Siberia in 1971. Many of these introductions have been sprouted. Sixty-five are represented by plants. In a few instances 25-50 plants are growing. In most instances only a few plants live. Introductions of 20 herbaceous perennials set out in 1972 were hardy except for Cupids dart, Catananche caerulea, PI 371835. This was entirely killed out with a loss of 14 plants. Seed was obtained from 15 introductions during 1973 including several species of Dianthus.

Woody introductions now as seedling include:

PI 369217 Caragana arborescens, USSR

PI 369222 Colutea orientalis, USSR

Several #s Carpinus betulus, Yugoslavia

PI 377795 Carpinus orientalis, Yugoslavia

Pl 377796 Celtis tournefortii, Yugoslavia

Several #s Cornus mas, Yugoslavia

3 introductions Ligustrum vulgare, Yugoslavia

PI 369275 Lonicera caerulea edulis, USSR

PI 369303 Potentilla fruticosa, USSR-Siberia

PI 371537 Prunus maacki, USSR-Siberia

PI 369315 Rosa acicularis, USSR-Siberia

PI 369316 Rosa rugosa, USSR-Siberia

d. Introductions available as bulbs, cuttings, or seed for research

Items propagated clonally 7 trees, 9 shrubs totalled 914 plants. In addition, 2 trees and 1 shrub were available as seedling.

3. Plant Pathology

a. Field screening of over 2,000 corn introductions for resistance to Diplodia stalk rot (to be completed in 1973), smut, and rust is continued. Several have shown enough resistance to warrant further testing.

b. Screening field grown tomato fruits for resistance to Rhizoctonia fruit rot in sand benches in the lab. Very few accessions are showing resistance, but a few will be further evaluated.

c. Greenhouse and laboratory screening of alfalfa for northern root knot nematode and Leptosphaerulina leaf spot resistance.

d. Relationship between geographic "races" of powdery mildew and resistance in cucumber introductions is being investigated in the greenhouse.

e. Evaluation of Crambe introductions for resistance to Alternaria and a virescence disease in the greenhouse.

f. Disease control in seed increase plots of the following:
   (1) Ergot in grasses. One year's burning of the overwintering stubble has not yet given satisfactory control.

   (2) Cucurbit viruses - mainly through eradication of diseased plants before going to the field.

   (3) Downy mildew in sunflowers.

g. Identification of new or unknown diseases. The previously mentioned virescent disease on Crambe has been of some concern in our plots the past couple of years. It appeared in a commercial acreage near Adel, Iowa, in 1972 at a level of 10-15%. Affected plants produce little or no seed, depending on when they become infected.

   Currently, we feel we have transferred this pathogen into cucumber, where it produces systemic, virus-like symptoms.

   Symptoms on Crambe include: dwarfing, phyllody (the flowers continue to grow, remaining green and leaf-like) sterility, and delayed maturity. There is almost a witches-broom effect in the overall plant appearance.

K. Introductions having special value

Plant introductions having special value which were used in breeding lines, new varieties or as germplasm of interest to other workers were reported previously in NC-7 annual reports. A few of the more significant ones are reported here:

1. Birdsfoot trefoil. Two trefoil introductions from USSR contributed to the variety 'Carroll' released by the Iowa Station in honor of the late Dr. Carroll P. Wilsie who developed it. 'Carroll' is a synthetic variety derived from PI 228151 (Kubanian 44) and PI 258467 (Morshansk 528) and is a winter hardy pasture type.

2. Corn. From Illinois, information was received that corn hybrids with Ht resistance to Helminthosporium turcicum from PI 217407, Ladyfinger popcorn, were widely used in the northern corn belt in 1972. This resistance gave excellent protection against Northern Corn Leaf Blight.

   These hybrids were planted on an estimated 5 million acres. It is also estimated that 30 to 50 bushels per acre more yield was obtained because of resistance. At $1.50 per bushel, this could mean an additional $200 million income for farmers and considerably more corn to add to the food supply.

3. Lettuce. Of 178 lettuce introductions tested four years in Wisconsin, five showed no infection by root rot in heavily infected fields where susceptible cultivars suffered extensive losses. An additional four introductions showed tolerance or resistance. The five showing no infection are:

165063	L. sativa	Turkey
184787	L. sativa	Netherlands
250427	L. sativa	Czechoslovakia
250429	L. sativa	Czechoslovakia
255568	L. sativa	Yugoslavia

   Those showing tolerance or resistance are:

187239	L. sativa	Belgium
206965	L. sativa	Turkey
229761	L. sativa	Iran
251790	L. sativa	Yugoslavia

   PI 171669 from Turkey contributed root rot resistance to the variety 'Marquette' released by the Wisconsin Station. Root rot resistance in this introduction was reported by Canadian workers in 1960. Later, workers at the Wisconsin Station used it in their screening work and found that it also had resistance to corky root.

4. Proso Millet
   a. A single plant selection from PI 222811, Panicum mileaceum from Iran was released as the variety 'Akron' by the Colorado Station. It is a red selection having high yield with good vigor. Because of the seed color, it is expected to be used largely for bird feed.

   b. A single plant selection from PI 223794, P. miliaceum from Afghanistan was released as the variety 'Leonard', also by the Colorado Station. The selection has tan or yellow seed, is five stemmed and very leafy with an open head. It has high yields and heavy test weight.

5. Red Clover. Two highly rust resistant clones were selected from each of two redclover introductions at the Wisconsin Station. One was PI 210370 from Iran and the other, PI 304784 variety 'Ulva', from Sweden. All four clones are being used to determine the inheritance of rust resistance. One rust resistant clone from PI 304784 is self-compatible.

6. Sunflowers. Germplasm segregating for recessive genetic male sterility was released by the Minnesota Agricultural Experiment Station in April, 1971. This germplasm was derived from the following sunflower plant introductions:

PI No.	Source	No. of lines
226466	Iran	24
228345	Iran	17
291404	Hungary	1

Germplasm having potential for rust resistance was also released by the Minnesota Station in April, 1971. This germplasm was derived from the following introductions:

PI No.	Source	No. of lines	Generation of lines
175728	Turkey	2	S_2
176975	Turkey	1	S_3
195945	Ethiopia	2, 12	S_2, S_3
226466	Iran	3	S_3
228345	Iran	7	S_3
253418	Spain	14	S_2

7. Tomatoes

a. Three tomato introductions were found to have resistance to bacterial canker and were used in a canker virulence test in Wyoming. One is a wild species from Ecuador, PI 251305 Lycopersicon hirsutum var. glabratum, another is from Utah, PI 344102, L. pimpinellifolium, 'Red Currant' and the third is PI 330727, L. esculentum from Bulgaria, 'Bulgaria #12'.

b. PI 330727 also contributed resistance to the bacterial canker resistant line H 2990 released jointly by Heinz USA and ARS, USDA. It is also resistant to Verticillium albo-atrum and Fusarium oxysporum f. lycopersici Race 1.

c. PI 204996 from West Virginia contributed late blight resistance to 'Ottawa 30' one of the parents used in 'Mini-Rose', a pink cherry tomato released by the Ottawa Research Station, Canada.

d. Resistance genes for Cladosporium leaf mold were obtained for six tomato introductions in Ontario, Canada. All incorporate moderate to high resistance to race 12 of C. fulvum. The gene from PI 187002, Guatemala has been designated Cf-5. PI 309906, Cuatemala, is immune to four races of leaf mold in greenhouse tests.

e. Tomato introductions were screened at Beltsville and at Connecticut for ozone resistance. At Beltsville, the following were found to be tolerant.

203229	L. esculentum	Australia
247089	L. esculentum	Australia
304234	L. esculentum	USA
309915	L. esculentum	Guatemala

The following were found to be resistant at Connecticut:

109835	L. esculentum	Morocco
237136	L. esculentum	Italy

285663 L. esculentum Poland
303792 L. esculentum Ohio 'Tatiner'

This represents a step toward tailoring plants to survive under certain conditions of pollution in the atmosphere.

8. Watermelon. The Kansas Station reported PI 248774 from Southwest Africa as being highly resistant to anthracnose. It was crossed with the Kansas Crimson Sweet Watermelon to transfer resistance into this variety.

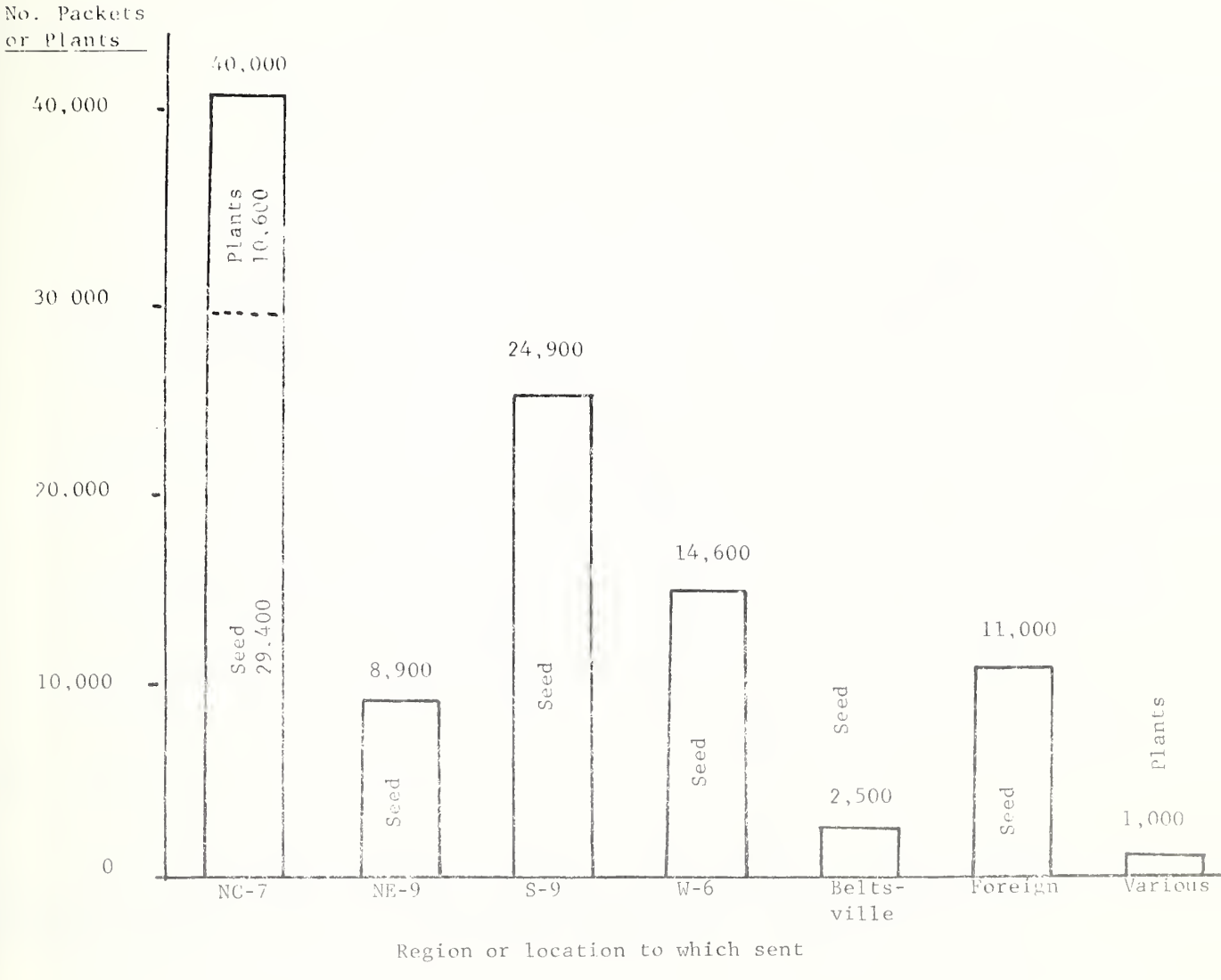

Figure 1. Distribution of seed and/or plants from the North Central Regional Plant Introduction Station during the ten year period, 1963-1972. Total distribution is 102,900.

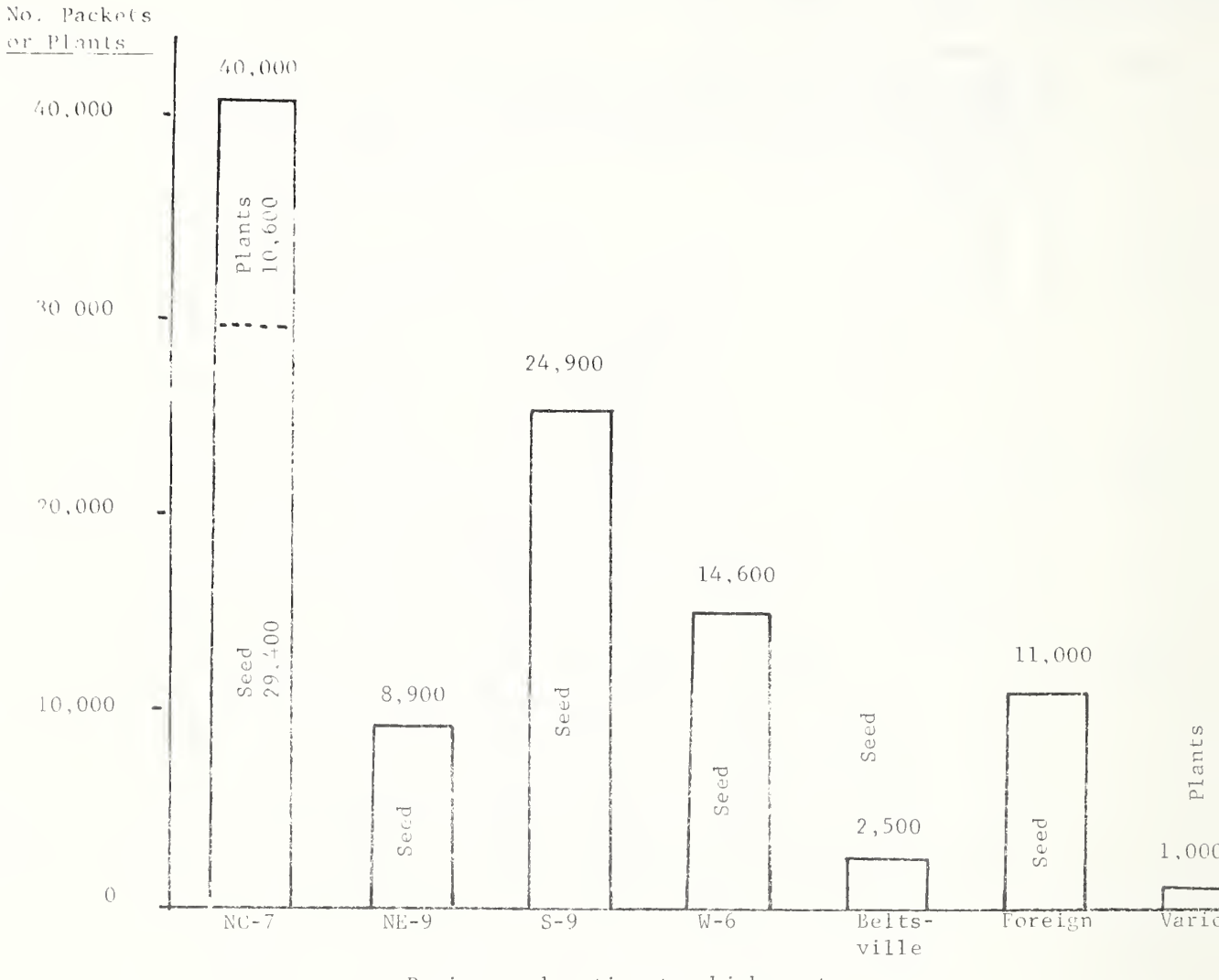

Figure 1. Distribution of seed and/or plants from the North Central Regional Plant Introduction Station during the ten year period, 1963-1972. Total distribution is 102,900.

B. Report to the National Coordinating Committee for New Crops
October 15-16, 1973
U.S. National Arboretum, Washington, D.C.
Northeastern Regional Plant Introduction Project (NE-9)

Desmond D. Dolan, Coordinator, Regional Project, NE-9
Horticulturist, North Atlantic Area, NE Region, ARS

INTRODUCTION

The regional Plant Introduction Station has now completed 20 years since its activation on October 15, 1953. During that period we have grown incoming introductions at the rate of approximately 1,000 per year and we now have in controlled atmosphere storage approximately 18,000 plant introduction seed lots that have been increased at Geneva.

A portion of many of these increased seed lots have been passed on to the National Seed Storage for long-term storage.

EVALUATION OF PLANT INTRODUCTIONS

The Plant Introduction Station at Geneva has approximately 120 plant scientists cooperators in the Northeast Region and they are kept informed of new findings in plant introductions and promising introductions through two different media.

1. Periodic memoranda to the Representatives, NE-9 which in the past have been released at the rate of approximately 4 to 5 per year. DRM-176 was dated July 12, 1973.

2. Supplements to the Annual Report of Regional Project, NE-9 which are entitled, 'Promising Introductions of the Year'.

Several years ago more than 1500 tomato introductions were screened for the capacity to germinate at 10°C. Individual plant selections were made for this trait and seed of the selections was increased and distributed to interested cooperators. Recent papers in both Crop Science and Proceedings of the American Society for Horticultural Science indicate that this trait is holding up and being used in several breeding programs. Also, the inheritance of the cold germinating trait has been studied and published on.

Similarly several years ago 500 onion introductions were screened for the capacity to germinate at low temperatures (10°C). Individual plant selections were made for this trait. The seedlings were grown to mature bulbs and a seed crop was produced. Seeds of the cold germinating onions were distriburied to interested cooperators and these onion selections are now being used in both genetic studies and onion breeding programs.

SCREENING OF PLANT INTRODUCTIONS FOR DISEASE RESISTANCE

Dr. Frank Pfleger, who is temporarily substituting for Dr. Braverman presently on a two-year stint in Nairobi, Kenya, is continuing the following programs on the screening of plant introductions for disease tolerance or resistance.

1. Carrot introductions in a search for tolerance or resistance to the bacterial blight caused by Xanthomonas carotae.

2. Cucumber introductions for tolerance or resistance to cucumber mosaic virus.

3. Alfalfa introductions for tolerance or resistance to both leafspot (Pseudopeziza medicaginis and blackstem (Ascochyta imperfecta).

4. Kentucky bluegrass and red fescue introductions for tolerance or resistance to leaf rust (Puccinia graminis and Puccinia pygmea respectively).

5. Kentucky bluegrass introductions for tolerance or resistance to powdery mildew.

The data from some of these screening tests have already been published in the Plant Disease Reporter.

ENTOMOLOGICAL STUDIES ON PLANT INTRODUCTIONS

The Plant Introduction Station, Geneva is providing seeds of various species to be used in an entomological study at the Department of Entomology, N. Y. State Agricultural Experiment Station, Geneva, N. Y. This is a biochemical search for substances in seeds that may retard or inhibit the metamorphesis of insects. That is, it may retard or inhibit the change from one stage to another stage as for instance the larval stage to the pupal stage. Or, it may retard or inhibit changes within the larval stage, that is from one instar stage to the next instar stage. To date the two genera that have provided the best chemicals are Lathyrus and Trigonella.

RESPONSIBILITY AND PRIORITY FOR CROP MAINTENANCE

The Plant Introduction Station, Geneva has the first responsibility for maintaining introductions of the following crops:- pea, maxima squash, broccoli and cauliflower, onion, perennial species of trifolium, tall oatgrass and timothy.

As the priority system stands presently the Northeastern Region does not have responsibility for either of the two most important vegetables in its region, namely bean and tomato and it does not have responsibility for the two most important turf grasses in the region, namely Kentucky bluegrass and red fescue.

PHOTOGRAPHS

The Coordinator then showed 1 dozen slides of some of the most promising tomato introductions recently grown and evaluated and 2 dozen slides of some of the most promising bean introductions recently grown and evaluated at Geneva.

RELEVANT PUBLICATIONS BY NE-9

1. Braverman, S. W. and D. D. Dolan. 1972. Field resistance to Erysiphe graminis in a collection of Poa pratensis. Pl. Dis. Rptr. 56(7):618-622. July 1972.

2. Dolan, D. D. 1972. Temperature, photoperiod and light intensity effects on the growth of pea introductions and cultivars. Crop Sci. 12:60-62.

3. Dolan, D. D. 1973. Temperature, photoperiod and light intensity effects on growth of Pisum sativum L. Hort Science 8:330-331. Aug. 1973.

4. Dolan, D. D. 1971. Desirable traits found in bean introductions. Bean Improvement Coop. and Report. 14:32-33.

5. Dolan, D. D. 1972. Woody ornamental introductions of the past - still in use. Northeast Regional Publications, Geneva Special Report No. 10. 25p.

6. Dolan, D. D. and S. W. Braverman. 1971. Winter survival and spring recovery of trefiol introductions at Geneva, N. Y. Lotus Newsletter II:5, March, 1972.

7. Dolan, D. D. and S. W. Braverman. 1971. Some disease tolerances found in bean introductions. Annual Report Bean Improvement Coop. 14:32-33, 1971.

8. Braverman, S. W. 1973. World search for plant disease resistance. New York Food and Life Sciences Quarterly 5(2):15-18, 1972.

9. Dolan, D. D. and S. W. Braverman and F. L.Pfleger. 1973. Walk-in drying room for removing moisture from seed crops of forage introductions. Agron. Jour. 65:678-680. 1973.

10. Pfleger, F. L. 1973. Reaction of Poa pratensis introductions to Puccinia graminis. Pl. Dis. Rptr. 57:595-598. 1973.

11. Pfleger, F. L. and D. D. Dolan. 1973. Field resistance to Pseudopeziza medicaginis in Medicago spp. Pl. Dis. Rptr. 57:468-471. 1973.

C. Southern Regional Project S-9

During the last two years 2526 new accessions were received at the Regional Station. Two large collections of mungbeans constituted about 60% of the new material. Other sizeable collections received were 220 clovers and medics from Australia, 106 peppers from Yugoslavia, and 64 cowpeas from Nigeria. The other new material represents many species from different countries. We now have at the Regional Station 28,000 accessions representing 265 plant genera. Some of the large collections are:

Plant name	No. of accessions
Arachis spp. (peanut)	4,054
Sorghum	3,504
Capsicum spp. (pepper)	2,008
Cucumis spp. (cantaloupe)	1,759
Vigna spp. (cowpea)	1,253
Phaseolus aureus (mungbean)	2,073
Citrullus (watermelon)	852
Warm season grasses	5,281
TOTAL	20,784

6100 accessions were grown at the Regional Station for seed increase and preliminary evaluation. In addition to these 1901 new mungbean introductions from India were increased and evaluated at the Oklahoma Experiment Station. Good seed increases were obtained from most of this material, but each year we encounter new introductions of various species that do not produce seed in the field at Experiment. This year we have perhaps 100 sorghum introductions from Ethiopia that have not yet flowered. These will be increased in the greenhouse this winter. Growing this material in the greenhouse is at best a stop-gap measure to prevent its loss. It does not provide enough seed for wide spread distribution to plant breeders. Within

our collection we have about 2000 introductions of various species that do not produce seed in the field under our conditions. I believe personnel and facilities should be provided to increase this material at a tropical location.

Several introductions that appeared to be of value in plant breeding programs were observed in the nursery during the last two years. Among them were peanut P.I. 362129 from India, a very dwarf compact plant, and peanut P.I. 362130 from India which has very narrow leaves. These may be of value as genetic markers. Cantaloupe P.I. 321005 from Taiwan is a high quality, disease resistant, melon that appears satisfactory as a home garden cultivar without modification. Multiple disease resistance of this cantaloupe was confirmed in replicated greenhouse tests. It has good resistance to downy and powdery mildews, and intermediate resistance to gummy stem blight. In the collection of grasses from South Africa Paspalum distichum, a low-growing rhizomatous grass, appears useful on rights-of-way of secondary roads that receive little or no maintenance.

The following groups of introductions were screened for resistance to certain diseases:

850 peanuts screened for resistance to Cercospora leafspot

170 peanuts screened for resistance to Rhizoctonia

230 introductions of Cucurbita pepo screened for resistance to watermelon mosaic virus

Resistance to Cercospora was found in P.I. 109839 from Venezuela and P.I. 259747 from Venezuela. Both of these were evaluated in the field in cooperation with a peanut breeder and they both appear to be useful in breeding for leafspot resistance. Results from preliminary screening indicated P.I. 161866 was resistant to Rhizoctonia solani but this was not

confirmed in a field test. Dr. Sowell is of the opinion that the technique used to inoculate plants in the field was a failure. Further tests with a more refined technique may verify resistance to Rhizoctonia in P.I. 161866.

None of the 230 squash introductions screened for resistance to watermelon mosaic virus showed a high level of resistance. However, four of them produced fruits with very mild symptoms.

Pepper, P.I. 271322, P.I. 322719, and P.I. 163192 were resistant to a Georgia isolate of Xanthomonas vesicatoria and a culture of the new race from Florida. Bacterial spot has not caused defoliation on A. H. Dempsey's breeding lines containing P.I. 163192 in the field over a ten year period. This indicates that the pathogen may be less likely to evolve new races under the relatively mild disease conditions of the pepper-growing area except Florida.

Questions have been raised about heterozygosity of plant introductions and some plant breeders are hesitant to use this material because of the variability. A screening test was conducted to determine the powdery mildew resistance of original seed and increase seed of 24 cantaloupe introductions that have been reported to be resistant. There was no significant difference between the level of resistance shown by original and increase seed in 22 out of 24 introductions. Another experiment was conducted to determine the variation within pepper P.I.'s reported as resistant to tobacco etch virus. All the plants of three introductions were free of symptoms when inoculated with the virus. The other three introductions reported as resistant showed a significantly lower infection than the susceptible check. Results from these two tests show that the plant breeder can obtain useful levels of resistance from plant introductions. Present practices for seed increase at the Regional Station are apparently adequate to prevent excessive dilution of genes for resistance.

Two formal requests for plant explorations were presented at the last meeting of the S-9 Technical Committee. The Texas station requested an exploration to Africa to collect sexual plants of Eragrostis curvula, Panicum maximum, and Cenchrus ciliaris. The Mississippi station requested an exploration to Southern Brazil and Uruguay to collect Paspalum species.

Since this committee last met a regional bulletin was published reporting the progress of the S-9 Project through 1969. Manuscripts are now being prepared for two regional bulletins reporting the progress made toward developing new chemurgic crops and evaluation of ornamental plants.

During the last two years several pieces of equipment were acquired and some improvements were made at the Regional Station. An irrigation system was installed underground; a dust exhaust system was installed in the seed cleaning building; two new tractors and a small thresher were purchased. Two incubators, a car, and several pieces of office furniture were acquired through transfer within ARS.

The nursery area now assigned to the Regional Station is inadequate. We need more land to grow winter crops and to evaluate certain grass introductions beyond the year of establishment.

If we continue to receive new introductions at the current rate, the seed storage room will be full in 4 to 5 years. Additional storage space will be needed. Although storage conditions with respect to temperature and humidity are satisfactory, the building is not worthy of this collection. We need a separate fireproof facility for seed storage.

Discussion

Langford again expressed the need of facilities and personnel at a tropical location to increase seed of tropical plant materials. Dr. Miravalle suggested sending sorghum introductions to Dr. Webster at Mayaguez and peanuts to Dr. Mixon. Dr. Jones stated that we would discuss this further in the ARS Germplasm Committee meeting.

D. NCC REPORT - Western Regional Project W-6 - S. M. Dietz

In the past 2 years W-6 made physical improvements and purchased some equipment as follows: built a new greenhouse with headhouse and heating plant at Central Ferry, converted a surplus truck into a fire truck with 1,000 gallon water tank, bought a used combine and various equipment for the farm, shop and laboratory as reported in our annual Minutes.

The Western Regional Station has had several staff changes. Dick Van Houten was hired as an ARS Biological Technician (7/8 time) to replace two ARS intermittent employees, Ms. Asante resigned her position and it was not refilled, and we have had several new secretaries. The Washington State Higher Education Personnel Board consolidated all salaried staff employed by 28 state institutions into a common salary scale. This has been under study for nearly 3 years and will be effective January 1, 1974.

Plant Material Activity

During the past 2 years, the Western Regional Plant Introduction Station received 1,890 accessions of new introductions for increase and maintenance, and sent out 32,342 introductions to cooperators; 8,659 of these were to foreign cooperators (2,348 in FY '72 and 6,311 in FY '73 plus 823 to Puerto Rico). We grew 9,773 for increase and testing.

Pullman records show that Western researchers received a grand total of 48,553 introductions (18,015 from Pullman and 30,538 from other sources) for their research during the past 2 years. During the same period our Station sent 1,723 introductions to the National Seed Storage Laboratory.

Inventories and Data Retrieval

We have now completed new inventories of all major crops held at Pullman. All but about 600 accessions on hand are in the computer using "TAXIR" (about 98 Allium, 60 ornamentals, 80 Leucaena, 45 Artemesia and ± 30 miscellaneous oil seeds, old Sipe materials, etc.). It now appears that FAO, IBP and other international agencies will be using an updated version of "TAXIR" for automatic data retrieval.

Station Activities

1. Entomology. Primarily concerned with natural host plant resistance (reduction of pesticides).
   a. Resistance to the pea weevil (Bruchus pisorum) which is an important pest in the Pacific northwest. Cooperative work with Dr. Pesho, entomologist, and Dr. Muehlbauer, agronomist and breeder.

b. Screening the Medicago collection for resistance to the root curculio Sitona hispidula. The work is being done in the central part of the state.
c. The European crane fly is a newly introduced pest in western Washington and work is being conducted at the Blaine Air Force Base. This crane fly (Tipula paludosa) not only effects crops and turf but is detremental to the motel industry as well.
d. A proposal for a coordinated effort to control the two spot mite in the field and greenhouse is being made. This will include the use of other preditor mites, sex attractants and screening for plant resistance.

2. Agronomic.
a. Approximately 1100 new grass accessions from Iran and Turkey collected by Dr. Dewey (ARS-Logan) and Mr. John Schwendiman (SCS-Pullman) are in their first year of growth. These are primarily Agropyrons, fescues, Elymus, etc.
b. Ornamentals and browse nurseries have been established at Central Ferry.
c. A much larger planting of Ecballium (squirting cucumber) has been established at Central Ferry. This work is being coordinated by Dr. Perdue at Beltsville and Dr. Cole of Tucson, Arizona, College of Pharmacy is conducting the analytical work. There is an anti-cancer factor (leukemia) found in the roots of this plant and apparently our Central Ferry site is one of the few places that continues to yield the active principal.
d. A number of plants of the genera Astragalus, Onobrychis, Dactylis, have been analyzed for crude fiber, protein, oxalates, tannins, alkaloids, etc.
e. Atriplex and Astragalus have been studied for their abilities to accumulate selenium and thus become toxic to stock.
f. Other cooperative work (Papaver).

3. Horticulture.
a. A newly approved State project (0194) on the Cookability of beans has been set up so that we can measure the Time-To-Breakdown during the cooking process. The cooking equipment is presently being automated for this purpose.
b. A winter hardy lentil selected in Turkey just came through a very severe winter at Pullman. Such a lentil could help in our erosion control, increased yields and possibly eliminate spring tillage. Lee Hudson, David Stout, and Dr. Muehlbauer have cooperatively planted the entire lentil collection for testing hardiness this winter.

We were honored by a visit from Academician D. Brezhnev and Dr. Smaraef from the Vavilov All-Union Institute of Plant Industry in the USSR on Labor Day of 1972. Drs. Lewis and Jones of the National Program Staff visited the Regional Station to discuss the National Plant Introduction Program.

Station Needs

1. The Western Regional Plant Introduction Station will be needing a new seed storage facility within two years.
2. We will need to undertake some form of land reclamation to correct the solonetz-type of soil condition at Central Ferry.
3. The Regional Station needs a plant pathologist to screen for disease resistance.
4. The Western Regional Station recognizes that the Principal Plant Introduction Officer occupies a very key position in the procurement and exchange of introductions, both domestically and abroad. We therefore strongly recommend that an understudy be hired for Mr. Hyland together with sufficient secretarial and clerical help for his office and the Inspection House. The work at all Regional Stations is dependent upon the smooth flow of plant materials with proper documentation. This is handled by the Principal Plant Introduction Officer, hence, our request is placed under station needs because his work so greatly effects our Station operations.

Historical Account of W-6 Plant Material Activity

Fiscal Year	New PI's Received	Accumulation Total	PI's Sent Out By Pullman Station1/	PI's Tested and/or Grown 2/	PI's Received by Western Reser. from Other Sources	Total Received by Western Researchers 3/
'48 to '52	1,984	1,984	---	---	---	---
1952	---	1,984	133	---	---	---
1953	1,310	3,294	2,277	80	1,000	3,277
1954	2,213	5,507	2,773	889	1,469	4,212
1955	1,631	7,138	2,052	1,073	1,378	3,430
1956	1,611	8,749	2,456	2,139	1,629	4,085
1957	1,331	10,080	2,216	2,032	1,565	3,781
1958	1,288	11,368	3,049	1,906	6,029	7,745
1959	2,448	13,816	2,151	3,185	4,403	5,703
1960	897	14,713	5,056	1,924	---	---
1961	819	15,532	3,249	1,542	5,600	7,572
1962	796	16,328	8,542	1,147	---	---
1963	976	17,304	5,264	2,040	---	---
1964	725	18,029	4,635	1,600	---	---
1965	493	18,552	4,934	1,838	---	---
17 yr. ave.	1,089	---	3,528	1,529	---	---
1966	2,939	21,461	6,085	2,123	---	---
1967	1,488	22,949	7,415	2,412	6,466	8,934
1968	1,161	24,110	11,070	3,071	4,676	15,746
1969	824	24,934	6,696	2,399	4,599	8,377
1970	570	25,504	10,872	6,015	6,090	15,092
1971	1,387	26,891 4/	24,680	5,073	7,967	11,401
1972	1,383	28,274 4/	15,935	5,797	6,039	19,227
1973	507	28,781	16,407	3,976	8,365	10,644
7 yr. ave.	1,393	---	11,822	3,842	---	---

1/ Does not include PI's sent to National Seed Storage Laboratory.
2/ Total tested or grown does not include additional increases by Arizona, Hawaii, Puerto Rico, Montana, Oregon, etc.
3/ Total received and tested by Western Researchers does not include domestic collections of pears, grapes, hops, etc.
4/ Total PI's received at Pullman is 28,274 but only about 20,000 in storage because some failed to germinate, but mostly because non-priority items were shipped elsewhere.

A. Report for 1975 Meeting of National Coordinating Committee on New Crops

W. H. Tallent
Northern Regional Research Laboratory

Introduction. This report supplements and updates one (dated 7-2-73) distributed to Regional New Crops Technical Committees. Besides developments in individual categories of research by the Industrial Crops (IC) Laboratory of NRRL, there is one aspect of a general nature that should be mentioned. In the past we have confined our efforts almost exclusively to prospective new industrial or chemurgic (as opposed to edible) crops. Lately, however, we have been asked to broaden our scope and devote a fraction of IC Laboratory resources--both personnel and computerized automated instrumentation--to problems pertaining to food and feed. For example, compliance with recent regulations concerning new plant varieties will require extensive and largely nonexistent information on all minor antinutritional constituents in current varieties. Through their work on crambe meal (and rapeseed meal for comparison), three IC chemists have become recognized experts on such constituents in cruciferous plants (i.e., glucosinolates or thioglucosides). They are now using background knowledge and methodology generated in their crambe research to obtain the required data for cruciferous vegetables.

Experience gained in the new (chemurgic) crops program is also relevant in a broader sense. Problems posed by the new plant variety regulations will best be solved by interdisciplinary approaches involving both plant breeders and chemists, and the effective cooperation that characterizes and is so vital to our work on chemurgic crops can serve as a model for such joint efforts.

Screening. New seed oil constituents found since 1970 have brought the total to 67. As I reported in 1971, the discovery rate is remarkably consistent at approximately one per 100 new species analyzed. Consequently, we can expect that the increase in samples being supplied by PGCI will result in more additions to the repertoire of diverse natural chemical entities available for technological utilization.

Computerization of instruments used in seed oil screening has further streamlined this work. The increased efficiency has made possible our analytical support of the Brassica breeding project and acceptance of a special assignment resulting from recent concern that sorghum and soybeans may become contaminated with jimsonweed (Datura stromonium L.) seeds.

Research formerly limited to Tephrosia rotenoids has now been broadened into a more general search for natural pest control agents (including possible anti-nematode factors in roselle and resistant lines of kenaf). Laboratories that have agreed to screen a taxonomically

diverse selection o' seed extracts include the European Corn Borer Research Laboratory (Ankeny, Iowa), Stored-Product Insects Research and Development Laboratory (Savannah, Georgia), and the Entomology Research Laboratory (Brownsville, Texas).

Kenaf. The shortage long predicted by pulp and paper specialists including NRRL kena' Research Leader, T. F. Clark, is now a fact widely publicized by the news media. This has accentuated industrial interest in kenaf. Fortunately, there are several positive developments to keep this interest alive. In addition to progress toward incorporation of nematode resistance and the success of a "commonizing" prepulping process step mentioned in the 7-2-73 report, rolls of kenaf-containing paper from 2-hour pilot plant production runs at the Herty Foundation (Savannah, Georgia) performed well in recent preliminary printing tests. Also very encouraging is the attention being given by the Bureau of Engraving and Printing to the possible use of kenaf-containing paper in food stamps.

Sperm Oil Replacements. The contract research on similated in-use evaluation that I mentioned in 1971 as a proposal is now well underway at the Southwest Research Institute in San Antonio, Texas. Liquid wax esters made from Limnanthes and crambe oil are holding up well in the strenuous test protocol.

Crambe. The Plains Co-Op Oil Mill (Lubbock, Texas) has become interested in crambe; and with the rapid disappearance of importable rapeseed oil as an erucic acid rich raw material, manufacturers of the valuable plastic film additive erucamide are stressing the importance of permanent crambe commercialization. A new concept in oilseed processing may prove beneficial to crambe. Involving high-shear wet grinding and subsequent screening to produce a protein-oil-water emulsion which is then separated into components by centrifugation, this novel approach has advantages over conventional solvent extraction of safety, lower capital investment, and production of water washed (hence higher quality) oil and protein fractions.

Antitumor Agents. The long sought breakthrough, conversion of cephalotaxine to one of its natural antitumor derivatives, has been achieved. Specifically, NRRL chemists have succeeded in synthetically transforming cephalotaxine into deoxyharringtonine. Combined with the successful synthesis of cephalotaxine itself in other laboratories, this should make available sufficient quantities of an active ester alkaloid for the National Cancer Institute to resume preclinical and subsequent clinical testing.

Comments on Energy and Agriculture

W. H. Tallent

According to Michael J. Perelman ("Farming with Petroleum," Environment, Vol. 14, No. 8, pp. 8-13 (October 1972)) energy equivalent to 150 gal. of gasoline is used per year by U.S. farmers for each American fed. This amounts to 5 calories used for every calorie of food delivered. No doubt there is room for improvement in the efficiency with which agriculture utilizes energy, but the simplistic blanket calculation leading to the 150 gal. figure is misleading in several respects:

1. It charges against production the energy consumed by farm families for their personal use (i.e., home and automobile, etc.).

2. It blames agriculture for the low conversion of feed protein to meat protein by livestock.

3. It ignores many industrial uses and exports of American agricultural products (though in fairness to Perelman, he did exclude energy expended on cotton and tobacco land).

4. It lumps field crops with much higher energy requiring vegetable crops.

By dealing with individual field crops and considering only specific significant energy requirements clearly chargeable to their production, one can arrive at conclusions more consistent with the expected contribution of photosynthesis. For example using production data supplied by several who had experience growing the respective crops (and their estimates were in reassuring agreement), I computed energy input equivalents of approximately 200 lbs of petroleum per acre for crambe and 300 lbs for kenaf. In return for these inputs crambe provides 500-700 lbs of seed oil and 1000-1400 lbs of high-protein meal per acre, and kenaf gives 5-15 (say 10 for easy calculation) tons of dry matter.

Crambe oil, though having about the same energy content as petroleum, is much easier to convert to valuable industrial products. That is, considerably more energy is required by the petrochemical industry to manufacture analogous products.

An interesting article entitled "Energy Forests and Fuel Plantations" by George C. Szego and Clinton C. Kemp appeared in Chemtech, May 1973 issue, pp. 275-284. These authors strongly support the contention that agriculture can be a major provider of energy. Multiplying the above mentioned kenaf yield by their conversion factor gives approximately 6000 lbs of petroleum equivalent.

The kenaf input-output balance can be viewed another way. Experimental plastic paper is being produced by several companies, notably in Japan. Since plastic sheets weigh only one-fourth as much as traditional lignocellulosic ones, the petroleum used to grow 10 tons (dry basis) of kenaf could instead be utilized to manufacture the equivalent of 4 X 300 = 1200 lbs of paper. But the kenaf dry matter gives approximately a 50% yield of paper, so 10 tons affords 10,000 lbs.

VII. Report from Soil Conservation Service

The Soil Conservation Service was not represented and it submitted no report. H. L. Hyland made a few comments about the SCS program. He stated that SCS is having its plant materials assigned P.I. numbers, and that Mr. Wayne Everett who was in charge of the SCS National Plant Materials Center at Beltsville has transferred to Lexington, Kentucky. Mr. Gilbert Lovell will be in charge of the National Plant Materials Center.

VIII. Plans for Plant Explorations

The following requests for plant explorations were presented and discussed:

1. Collection of Crambe during FY-74 in Israel, Southern Italy, Southern Spain, Portugal, Morocco, Tunisia, and Algeria by G. A. White and K. J. Lessman.

2. Dr. Jackson: Why should two people go on a collecting trip?

   Dr. White: To get better coverage of the area.

2. Collection of kenaf in East Central Africa. Requested by Dr. White.

3. Collection of tomatoes for new sources of disease resistance in Central America and Northwestern region of South America. Requested by Dr. White.

4. Collection of Paspalum spp. from Uruguay and Southern Brazil. Requested by Dr. Whiteley.

5. Collection of sexual clones of Eragrostis, Cenchrus, and Panicum from South Africa. Requested by Dr. Whiteley.

6. Collection of Triticum spp., Agropyron, and related grasses in Southern Russia. Requested by W-6 Project.

7. Collection of wild spp. of Avena in Northern U. S. from Minnesota to Washington and Northern California. Requested by NC-7.

8. Collection of junipers in U.S. Requested by W-6.

After considerable discussion of each proposal as to need, personnel involved, date of proposed travel, and cost involved, Dr. Skrdla moved that we accept the Crambe exploration presented by Dr. White and recommend that it be supported financially by ARS during FY-74. Seconded by Dr. White. Motion approved.

Dr. Skrdla moved that the other 7 proposals for plant explorations be accepted by the National Coordinating Committee and recommended to the ARS Germplasm Coordinating Committee for study and establishing priorities for them. Seconded by Dr. Whiteley. Motion approved.

Proposal for the Exploration of Foreign Paspalum Species

TO: ARS Plant Germplasm Coordinating Committee

FROM: Agronomy Department, Mississippi Agricultural and Forestry Experiment Station. Mississippi State, Mississippi; Department of Soil and Crop Sciences, Texas A&M University; and USDA, ARS, College Station, Texas.

Date: October 19, 1973

1. Title: The Exploration of South American Paspalum Species

2. Objectives:

   a. Collect different biotypes of dallisgrass, Paspalum dilatatum Poir, with emphasis on sexual plants.

   b. Make a collection of bahiagrass, P. notatum Flugge, types with emphasis on those which might be associated with the bacteria, Azotobacter paspali.

   c. Collect material of as many different Paspalum species as possible with emphasis on sexual types.

3. Justification:

   Paspalum is a large diverse genus with more than 400 species (8). Its center of origin is generally considered to be Southern Brazil, Uruguay, Paraguay, and Northern Argentina. During the past few years, there has been an increase in the acreage of annual crops, primarily soybeans and wheat, in this region. In the Brazilian state of Rio Grande do Sul, the expected increase in soybean acreage is 30.8% and 42.9% for 1973 and 1974, respectively (11). Official sources state that in the past the increased soybean acreage has been at the expense of other crops; however, from now on, soybean acreage will increase mainly at the expense of cattle growing areas (11). Thus, a number of species have already been lost and with the present trend, others will soon become extinct. An extensive plant collection expedition into the above region is needed in the near future to collect irreplaceable endangered germ plasm which is desperately needed in Paspalum plant breeding programs. Several Paspalum species are valuable pasture grasses in the southeast U.S. with dallisgrass and bahiagrass the more widely used.

   Common dallisgrass is an important forage grass because it grows well in combinations with other forage species, persists under grazing, and produces highly nutritious forage. The high forage quality is its most important trait. Its use is limited, primarily, because of low seed fertility and susceptibility to ergot,

Claviceps paspali Stevens and Hall. If a fertile line of common dallisgrass were available, it has been estimated that the increased income in Mississippi would be over $5,000,000 per year (11). Therefore, the increased benefits to the southeast U.S. would be in the excess of $25,000,000 per year.

Common dallisgrass reproduces by apomixis (3). This phenomenon prevents gene manipulation and explains why conventional plant breeding programs have been unsuccessful in improving dallisgrass (7). When cross compatible sexual plants are available to use as female parents, apomixis becomes a useful tool to the plant breeder. When a sexual plant is crossed with its apomictic counterpart, the manipulation and control of the genes for obligate apomixis is possible and leads to a highly effective grass breeding program. This technique was used in developing Higgins buffelgrass Cenchrus ciliaris L. (2). The key to the development of this variety was the discovery and utilization of a sexual plant into the breeding program (13). Prior to this, buffelgrass and dallisgrass improvement were similar in that selection of the superior apomictic accessions was the only means available. One sexual accession of dallisgrass from Uruguay has been recovered and crossed with apomictic common dallisgrass (4). Even though fertile plants were recovered, none of the selections are as good forage types as common dallisgrass.

The discovery of this sexual plant suggests that more sexual plants are available in the native habitat. The fact that sexual plants have been found in what was once considered to be completely apomictic species, buffelgrass (1), weeping lovegrass (Eragrostis curvula/Schrad./ Nees) (14) and guineagrass (Panicum maximum Jacq.) (12), strongly supports the above hypothesis. Therefore, we believe that every effort should be made to obtain a special collection of sexual dallisgrass plants from its native habitat.

Since bahiagrass, P. notatum, grows on the sandy unproductive soils in the southeastern U.S. and occupies a large acreage, it is an important forage grass. Low forage quality is its most undesirable trait. If plant material were being collected in South America, it would provide an opportunity to obtain superior forms of bahiagrass.

Recent findings have shown that free living nitrogen fixing bacteria, Azotobacter paspali, were present in the rhizosphere of a Brazilian cultivar of bahiagrass. Under laboratory conditions, it was estimated that the association resulted in the fixation of as much as 90 Kg of N per ha per year (80 lbs. N/acre) (9). It was also found that such a relationship did not exist between the bacteria and Pensacola bahiagrass.

Since bahiagrass is often grown on the poorer soils in the southeastern states, an association of this type would be of tremendous benefit. The economic value of the fixation of this amount of N would be of impact on forage production. If a fertilizer shortage becomes a reality in the future, its value will be enhanced. For this reason a collection of bahiagrass types from Brazil could be invaluable.

Since dallisgrass is a natural hybrid, the Mississippi Agricultural and Forestry Experiment Station and USDA, ARS initiated a phylogenetic investigation to determine the relationship of dallisgrass to other Paspalum species in order to identify its progenitors. With this information, synthesis of a fertile dallisgrass might be possible through interspecific hybridization. Recent studies using the sexual dallisgrass introduction have indicated that two introduced diploid species, P. intermedium Munro and P. jurgensii Hackel, are closely related to dallisgrass and could be two of its progenitors (5,6). Additional sexual Paspalum species are needed for further phylogenetic studies, and this information is needed to synthesize a fertile dallisgrass plant of economic value.

The need for superior grass varieties which can be effectively and efficiently established and managed is urgent and ever increasing. The proposed collection should provide valuable germ plasm for breeding programs in several Southern states.

4. Approach:

Some important factors should be considered in planning a collection of sexual material of predominantly apomictic species. The most vigorous plants are not necessarily the most desirable. Sexual plants, desperately needed for the breeding program, may appear useless and escape the attention of the collector unless he is specifically trained to search out particular types. Greatest success would be expected in sites of maximum variability comprising unique individual plants. The collection should be made by a scientist familiar with the breeding programs of the species if at all possible. We feel the best approach would be for an experienced plant collector to be accompanied by the person knowledgeable of Paspalum genetics and breeding. Those making the collection can be placed in contact with scientists in the various countries who can provide valuable information on the probable sites and seasons for best collection.

The expedition should require 2 or 3 months during December, January and February. Collections will be made from the remote grasslands of Southern Brazil, Uruguay, Paraguay, and Northern Argentina. Both vegetative material and seed of the desired types and species will be collected.

After the material is sent to the United States, it will be placed under quarantine for the required time period and then sent to the USDA Plant Introduction Station at Experiment, Georgia. Then the material would be available for distribution to those interested states in the Southeast.

5. Budget:

An exact budget is difficult to determine at the present. The following is based upon current transportation costs and AID per diem allocation for Brazil. The total expenses are based on two people.

(a)	International Travel: New York to Rio de Janeiro, Brazil and return $800.00/person	$1600.00
(b)	Domestic Travel: Intercountry Travel (Brazil to Uruguay to Argentina to Paraguay to Brazil) $300.00/person	600.00
	Intracountry Travel (Vehicle rental, driver, gasoline, etc.)	1000.00
		$1600.00
(c)	Per Diem ($30/day) 90 days - $2700/person	$5400.00
(d)	Misc. Sending Plant Material to U.S., etc.	200.00
		$8800.00

6. Suggested Personnel:

Byron L. Burson, Agronomy Department. Mississippi Agricultural and Forestry Experiment Station, Mississippi State, Ms. or,

E. C. Bashaw, USDA, ARS, Department of Soil and Crop Sciences, Texas A&M University, College Station, Texas, and

A. J. Oakes, USDA, Beltsville, Md.

References

1. Bashaw, E. C. 1962. Apomixis and sexuality in buffelgrass. Crop Sci. 2:412-415.

2. Bashaw, E. C. 1969. Registration of Higgins Buffelgrass. Crop Sci. 8:397-398.

3. Bashaw, E. C., and E. C. Holt. 1958. Megasporogenesis, embryo sac development, and embryogenesis in dallisgrass, Paspalum dilatatum Poir. Agron. J. 50:753-756.

4. Bennett, H. W., B. L. Burson, and E. C. Bashaw. 1969. Intraspecific hybridization in dallisgrass, Paspalum dilatatum Poir. Crop Sci. 9:807-809.

5. Burson, B. L., and H. W. Bennett. 1972. Genome relations between an intraspecific Paspalum dilatatum hybrid and two diploid Paspalum species. Can. J. Genet. Cytol. 14:609-613.

6. Burson, B. L., H. S. Lee, and H. W. Bennett. 1973. Genome relations between tetraploid Paspalum dilatatum and four diploid Paspalum species. Crop Sci. 13: (In press).

7. Burton, G. W. 1962. Conventional breeding of dallisgrass, Paspalum dilatatum Poir. Crop Sci. 2:491-494.

8. Chase, A. 1929. The North American species of Paspalum. Contr. U.S. Natl. Herb. Vol.28 (Part 1):1-310.

9. Dobereiner, J., J. M. Day, and P. J. Dart. 1972. Nitrogenase activity and oxygen sensitivity of the Paspalum notatum - Azotobacter paspali association. J. Gen. Micro. 71:103-116.

10. Roark, D. B., J. W. Lusk, J. T. Miles, W. C. Cowsert, and R. E. Waters. 1953. Pastures for dairy cattle. Miss. Agr. Exp. Sta. Bul. 507.

11. Rocha, J.A.M., M.G.C. Vasconcelas, A. Beckei, J. A. Oliveiia, A. Guns, and L.C.M. Silva. 1973. Soja Analise e Perspectivas Economicas. Government of the State of Rio Grande do Sul, Brazil, Secretary of Agriculture p. 1-23.

12. Smith, R. L. 1972. Sexual reproduction in Panicum maximum Jacq. Crop Sci. 12:624-626.

13. Taliaferro, C. M., and E. C. Bashaw. 1966. Inheritance and control of obligate apomixis in breeding buffelgrass, Pennisetum cilare. Crop Sci. 6:473-476.

14. Voigt, P.W. 1971. Discovery of sexuality in Eragrostis curvula (Schard.) Nees, Crop Sci. 11:424-425.

IX. Information Retrieval, Computerization of P.I. Records - Richard Sooy

Mr. Sooy discussed the needs for a centralized gene bank storehouse of information, and he indicated that technology is available to develop it. He suggested that we put on tapes the data we now have about plant introductions obtained since 1948. This would take care of 90 percent of the plant introductions that are still available. Lack of labor is the greatest deterrent to doing this. Personnel is needed to get data in shape to be recorded on tapes. A standardized procedure should be adopted.

Dr. Jackson: Does the Germplasm Resources Laboratory know what we want in Data Retrieval; if so do you know how you will achieve it?

Dr. Jones: We have no concrete plan. Many diverse plans exist now, and we can develop a centralized plan.

Dr. Jackson: Who will devise such a plan?

Dr. Lewis: Suggested that Mr. Sooy devise a plan and coordinate this work. This problem will be discussed further at the meeting of the ARS Germplasm Committee.

X. Other Topics

A. Quarantine Restrictions on Corn, Millet, Sorghum

Mr. Hyland called attention of the group to new restrictions placed on the importation of corn, sorghum, and millet. Regulations were revised recently to prohibit the indiscriminate entry of sorghum seeds from Africa and many Asian countries because of the high risk of introducing new diseases. Similar restrictions were placed on corn and millet from certain countries. Importations for scientific purposes are still allowed provided the requirements for importation as set forth by the Animal and Plant Health Inspection Service are met. The importer must obtain a permit from the Plant Protection and Quarantine Programs, APHIS, USDA, Federal Center Building, Hyattsville, Md. 20782, authorizing him to import sorghum, corn, or millet. The permit will specify the conditions under which the seed can be imported.

Mr. Hyland suggested that Regional Coordinators concerned with these crops work out with APHIS an acceptable procedure for handling new introductions of corn, sorghum, and millet.

B. Plant Pathogens

Dr. Jackson reported on a survey he made to determine what procedures are used to prevent the introduction of new diseases with the introduction of seeds and plants, and also whether new procedures should be adopted to guard against introduction of new diseases. He stated that no new pathogens have been loosed on the countryside to date through the Plant Introduction Program. He indicated that much more money and scientific personnel would be needed to further improve the present method of guarding against introduction of new diseases.

C. Status of Soybean Germplasm

Mr Hyland reported that all soybean introductions are sent to Urbana, Illinois. Some, depending on their maturity, are then channeled to other locations. Soybean introductions within maturity groups 5 through 8 are maintained at Stoneville, Mississippi. Presently there are 1073 introductions held at Stoneville. Many others are maintained at Urbana. Dr. Lewis indicated that if and when U.S. plant exploration is allowed in China, collection of soybean germplasm will have very high priority.

D. Clonal Repositories for Fruits

Dr. Ronald M. Peterson presented the following report pointing out the need for preservation of fruit crops germplasm:

Report to National Coordinating Committee regarding concerns of NC-7 and the Fruit Crops Sub-Committee for a fruit germ plasm preservation program. (October 15-16, 1973)

The question of the preservation of clonal germ plasm has been discussed by this committee and other groups over a period of several years. The need is recognized but implementation of a fruit clonal germ plasm preservation program has not occurred. Two years ago the question of the need for a national clonal repository was referred by motion of the National Coordinating Committee to the American Society for Horticultural Science for their reappraisal and recommendation. In follow up with the president of ASHS, Dr. Bukovac, and the Executive Secretary, Cecil Blackwell, it appears that ASHS was not contacted. However, the need continues and is probably greater today than in the past.

Recent developments point out the need for a fruit germ plasm preservation program. Closing of the Chico Plant Introduction station in December of this year forces states, private entities, and other agencies to assume responsibility for future clonal preservation of materials on hand there. There also is a tendency for many state experiment stations to remove existing fruit collections due to shortages of funds. Examples are shown in Minnesota (Prunus collection removed), South Dakota (portions of Hansen hardy fruit collection removed), and other states. Collections are currently in jeopardy in other states. At the same time modern agriculture is resulting in reduced numbers of cultivars in the world further reducing genetic variation. Yet human dietary needs, esthetic desires for fruit, and a pollution conscious world wanting increased biological pest control dictate the need for continued vigorous fruit breeding programs.

Reasons that argue for the clonal maintenance of fruit genotypes are as follows:

1. Seed, pollen, and tissue culture research on fruit crops has not progressed to the point that storage of these tissues is a safe method for preserving them.

2. Potential for future mutation breeding will be lost if the living cells of many existing elite cultivars aren't kept.

3. Gametes of desirable parents can be available with no time delay if flowering age propagules are maintained, while long delays will be necessary to bring seed to flowering stage.

It has been readily apparent at this meeting that considerable attention is given both in the USA and throughout the world for preservation of such crops as cereals, cotton, many vegetables and legumes, and other crops. By contrast there appears to be almost no organized effort to preserve another major food item - the fruit crops.

It is of vital importance that concerted positive effort be made to establish a clonal fruit germ plasm preservation program. Our North Central Fruit Crops Subcommittee is very concerned about this matter. Possibly similar subcommittees or ad hoc committees in other regions could work together on a fruit germ plasm preservation program.

Another approach to this, and possibly a more positive approach, would be to ask ARS to request the National Academy of Science to determine the genetic vulnerability of fruit germ plasm. The challenge is of great enough significance that positive steps should be renewed for a fruit germ plasm preservation program.

Respectively submitted,

Ronald M. Peterson, Chairman
NC-7 Fruit Crops Sub-Committee

Dr. Peterson moved that we ask ARS to request the National Academy of Science to determine the genetic vulnerability of fruit crops. Seconded by Dr. Dietz. Motion approved.

E. NSSL Representation on Regional Technical Committees

Dr. Wilson moved that Dr. Louis Bass, Head of NSSL, be made a member of each Regional Technical Committee for New Crops and encouraged to attend the annual meetings of these committees. Seconded by Dietz. Motion approved.

XI. Committee Reports

Dr. Skrdla read the following report of the resolutions committee and moved that it be adopted. Seconded by Whiteley. Motion approved.

Be it resolved that the National Coordinating Committee:

1. Is deeply concerned about the future of the Inter-Regional Solanum Project IR-1. This program has been a model of germplasm maintenance. IR-1 has been effective in converting exotic germplasm into forms sufficiently similar to the commercial potato for effective use in cultivar development.

   The effective use of material, nationally and internationally, from the collection has been clearly documented in publication records and in the parentage of cultivars introduced into commence.

   It is imperative that ARS appoint a replacement to fill the vacancy created by the resignation of Dr. Roger Rowe, as soon as possible, thus assuring leadership for the IR-1 project.

2. Recognizes the national and international impact of plant germplasm on agricultural improvement programs. It is imperative that expanded support be given to those agencies involved in the procurement, maintenance and utilization of such germplasm. Such support relates specifically to the ARS Germplasm Resources Laboratory, Beltsville, Maryland.

   The New Crops National Coordinating Committee recommends that the Administrator of ARS and the National Program Staff take immediate action to provide sufficient logistic support for a viable, constructive and productive germplasm program, including personnel, equipment and operating funds, for the introduction, processing, documention (including published plant inventories), and distribution of plant introductions in accordance with national needs and priorities for the benefit of U.S. crop specialists.

3. Recognizes that much of the germplasm used by plant scientists is held by commercial companies and state or federal agencies. Many of these germplasm collections may be lost when the plant scientist

responsible for a collection retires or when the scientist has no further use for the material in the collection. The National Coordinating Committee recommends that ARS provide a mechanism for maintaining these collections by direct support to the state experiment station where the collection is being maintained or to the plant introduction station or other facility to which it might be transferred for preservation.

4. Reaffirm its position concerning the increased level of support for the National Seed Storage Laboratory as recommended at the 1971 meeting. The Committee notes the favorable response received from Mr. T. W. Edminister to their recommendation but urges that increased support for that facility be implemented as soon as possible.

5. Recognizes the eighteen years of distinguished service contributed by Dean E. F. Frolik, as Administrative Advisor to Regional Project NC-7 and as member, vice-chairman, and past chairman of the National Coordinating Committee, which recently came to a conclusion. The National Coordinating Committee gratefully expresses its sincere appreciation and acknowledges its indebtedness to Director Frolik for his outstanding service and personal committment in contributing so fundamentally to furthering the concepts and practices of regional cooperation in research with new crops.

6. Extend its appreciation to Dr. J. L. Creech and other staff members at the National Arboretum for their generous hospitality and for providing excellent facilities in hosting the meeting of the National Coordinating Committee. Appreciation is also expressed to members of the Plant Germplasm Resources Laboratory, G. A. White, H. L. Hyland, H. F. Winters, and A. J. Oakes for their assistance and courtesies. The Committee also expresses its appreciation for the contribution of Quentin Jones and C. E. Lewis.

XII. Plans for Next Meeting

Plans for the next meeting of this committee will be announced by the chairman.

Dr. Whiteley moved that we adjourn and we did without hesitation.

Summary of Motions adopted:

1. Dr. Skrdla moved that we accept the Crambe exploration presented by Dr. George White and recommended that it be supported financially by ARS during fiscal year 1974. Seconded by Dr. White. Motion approved. (See page 88)

2. Dr. Skrdla moved that the other 7 proposals for plant explorations be accepted by the National Coordinating Committee and recommended to the ARS Germplasm Coordinating Committee for study and establish-priorities for them. Seconded by Dr. Whiteley. Motion approved. (See page 89)

3. Dr. Peterson moved that we ask ARS to request the National Academy of Science to determine the genetic vulnerability of fruits. Seconded by Dr. Dietz. Motion carried. (See page 99)

4. Dr. Marvin Wilson moved that Dr. Lewis Bass, Head of NSSL, be made a member of each Regional Technical Committee for New Crops and encouraged to attend the annual meetings of these committees. Seconded by Dr. Dietz. Motion carried. (See page 99)